

# Starrett®

Precision, Quality, Innovation

## METROLOGY SYSTEMS

Vision Measurement Systems

Optical Comparators

Software



Catalog 82



# PRECISION, QUALITY, INNOVATION

For more than 140 years, the Starrett name has been associated with exceptional quality when it comes to optical, vision and multi-sensor metrology systems, force and material testing, laser measuring, granite tables, precision hand tools, gage blocks, saws and power tool accessories. These systems and products have been expertly crafted with the user in mind with a focus on accurate, reliable, and repeatable results that can be depended on for years to come. Starrett stands behind their commitment to excellence with expert technical assistance with all of our products in order to achieve maximum customer satisfaction.

This catalog has been updated for 2020/2021 to feature the latest Starrett metrology solutions, their characteristics, and their applications.



Starrett

Starrett Kinematic Engineering, Inc.  
an ISO9001:2015 Certified Company  
see QR code (right) to view certification





## VISION MEASUREMENT SYSTEMS

Video-based measurement systems combine high-resolution images, powerful intuitive software and precision mechanical platforms to deliver superb accuracy and repeatable measurement results for a wide range of precision measurement applications.

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Optical comparators provide a time tested, cost effective solution for non-contact measurement. Optical comparators are used for an exceptionally wide range of dimensional measurement and inspection applications.

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# METROLOGY SYSTEMS

# FACTORIES AROUND THE WORLD



1-Athol, Massachusetts, USA



2-Laguna Hills, California, USA



3-Waite Park, Minnesota, USA



4-Cleveland, Ohio, USA



Factories and Distribution Centers



Starrett Distribution Centers and Offices





5-Mount Airy, NC, USA



6-Columbus, Georgia, USA



7-Itu, São Paulo, Brazil



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PRECISION MAKES THE DIFFERENCE

## FOR OVER 140 YEARS, WITH INNOVATIVE TECHNOLOGIES.

Offering more than 5,000 products including precision tools, vision systems, force measurement systems, non-contact measurement systems, optical comparators, granite tables band saw blades, band saw machines, hand tools and power tools accessories.

Read more: [www.starrett.com](http://www.starrett.com)



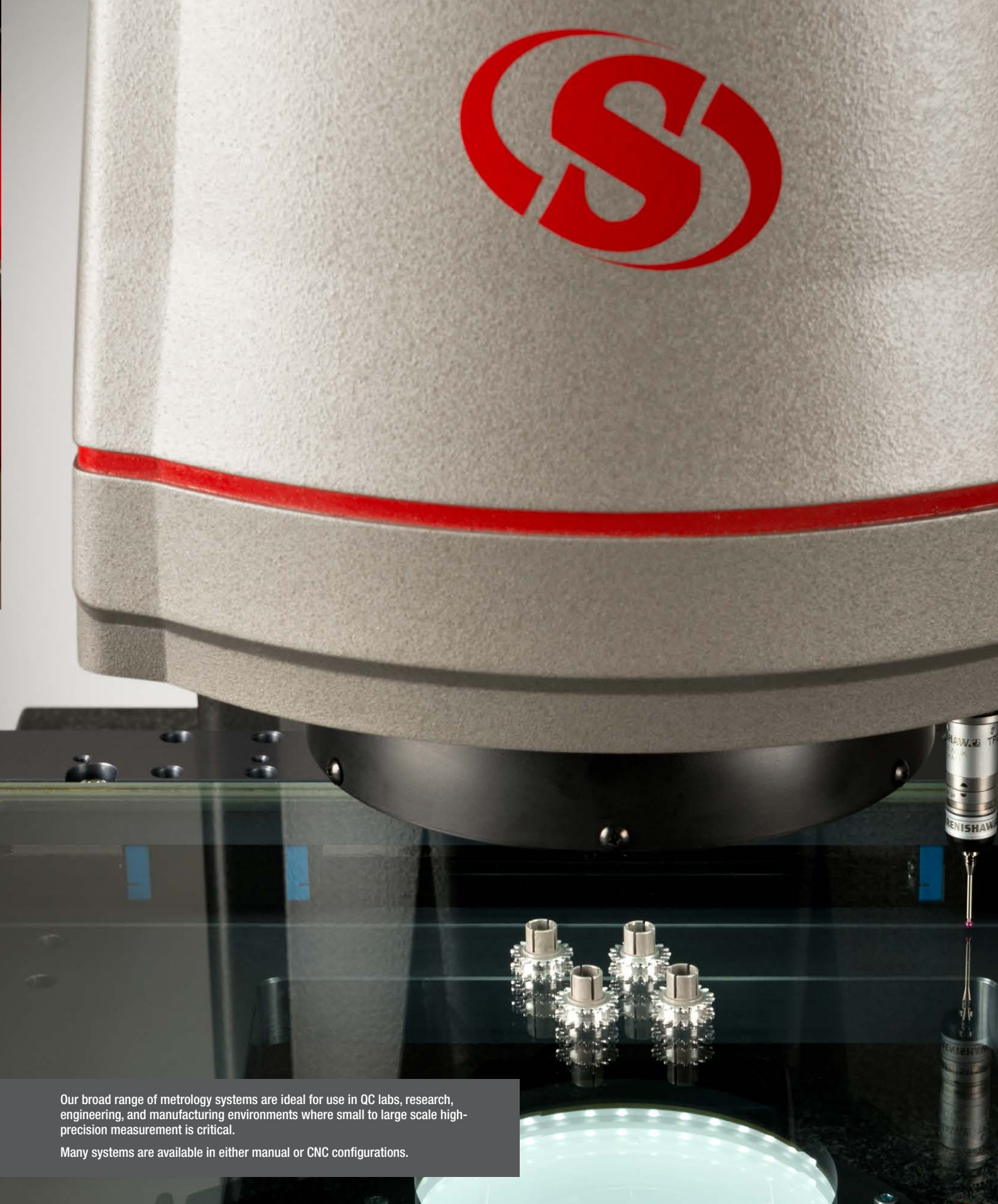
# Starrett®

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Our broad range of metrology systems are ideal for use in QC labs, research, engineering, and manufacturing environments where small to large scale high-precision measurement is critical.

Many systems are available in either manual or CNC configurations.

## VISION SYSTEMS



# MANUAL VISION METROLOGY SYSTEMS

## MVR

### MVR200 AND MVR300

The MVR Manual Vision Metrology Systems are ideal when quick measurements for quality control are needed. They are available with dedicated zoom optics or a quick-change bayonet lens mount which accepts interchangeable zoom optics or telecentric lenses for micron-level resolution. With a maximum field of view (FOV) of 0.93" (24mm), and seamlessly integrated stage motion, the MVR series is capable of measuring parts with a length up to 8" (200mm) or 12" (300mm) for the MVR 200 and 300, respectively. The operator interface is the MetLogix™ M3 software that displays a live video image of the part plus geometry tools and digital readings. The image of the part can be resized using zoom and measurements can be taken by simply touching a feature on the touch-screen monitor. MVR hardware features include a granite base for maximum stability, precision linear guides for smooth, accurate stage motion and a motorized Z-axis with variable speed control.

### FEATURES AND SPECIFICATIONS

- Z travel: 8" (200 mm)
- Manual X-Y positioning via hand wheels
- Motorized Z-axis positioning with variable speed control
- MetLogix™ M3 metrology software
- Video edge detection (VED)
- Field-of-view (FOV) measurements integrated with stage motion
- Renishaw scales for 20µin (0.5µm) of X and Y resolution
- Color digital video camera
- Collimated LED sub-stage illumination
- Ring light LED surface illumination
- Granite base

### OPTIONS

- Dedicated or interchangeable 6.5:1 zoom lens
- Quick-change bayonet lens mount for interchangeable zoom or telecentric optics
- Auxiliary lenses for zoom optics: 0.5x, 1.5x and 2.0x
- Interchangeable telecentric lens magnifications including - 0.3x, 0.5x, 0.8x, 1.0x, 2.0x and 4.0x
- DXF/FOV option for automatic comparison to CAD files
- Modular system workstation
- Calibration standards
- Thread measurement software module
- Part fixtures and work holding devices



Click the QR code to  
view the MVR Series





### MVR Optics

Optical Parameters	Interchangeable Telecentric Optics						MVR-FOV Models, Interchangeable 6.5:1, Zoom Optics	Standard MVR Models, Dedicated 6.5:1, Zoom Optics
Optical magnification on CCD	0.30x	0.50x	0.80x	1.0x	2.0x	4.0x	0.7x to 4.5x	0.47x to 3.0x
Total magnification on monitor	13x	22x	36x	45x	89x	178x	31x to 200x	31x to 200x
Field of view width	0.93" (24mm)	0.55" (14mm)	0.35" (8.9mm)	0.27" (7mm)	0.14" (3.5mm)	0.07" (1.8mm)	0.39" to 0.06" (10mm to 1.6mm)	0.39" to 0.06" (10mm to 1.6mm)
Field of view height	0.76" (19mm)	0.45" (11mm)	0.29" (7.4mm)	0.22" (5.6mm)	0.12" (3mm)	0.06" (1.5mm)	0.32" to 0.05" (8.1mm to 1.3mm)	0.32" to 0.05" (8.1mm to 1.3mm)
Working distance	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	3.47" (88mm)	3.47" (88mm)
Camera CCD	1/1.8"	1/1.8"	1/1.8"	1/1.8"	1/1.8"	1/1.8"	1/1.8" CCD Array (2MP)	1/3" CCD Array (1.3MP)

### Specifications

	MVR200	MVR300
Net Weight	145lbs 90kg	230lbs 113kg
Shipping Weight	375lbs 170kg	450lbs 205kg
X-Y-Z Travel*	8" x 4" x 8" 200mm x 100mm x 200mm	12" x 8" x 8" 300mm x 200mm x 200mm
X-Y-Z Accuracy**	2.5µm + 5L/1000	2.5µm + 5L/1000

\*Z value only applicable when configured with 3-axis option.

\*\*X-Y-Z specific accuracies are dependent on lens configuration setup.

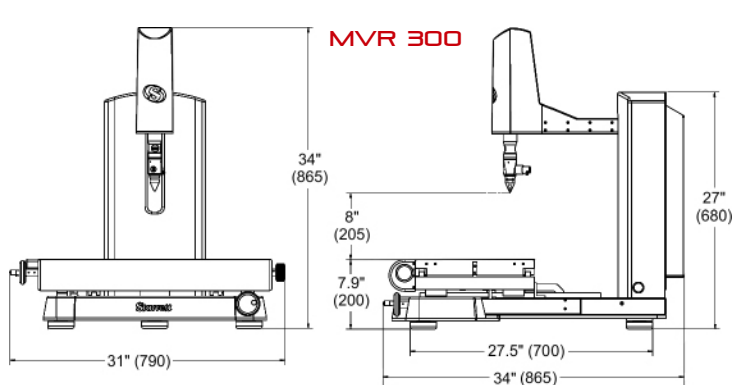
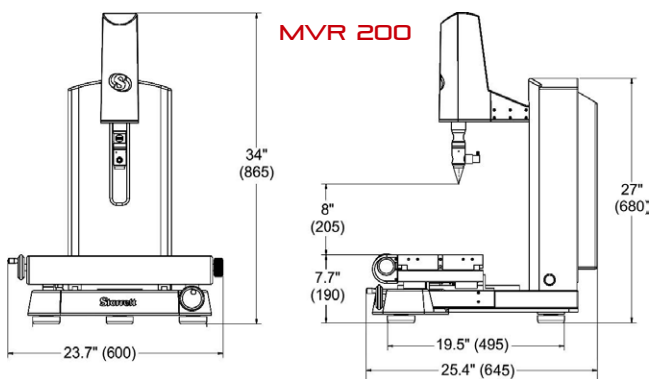
### Operator Interface

Feature	All-in-One PC with M3 DXF/FOV Software
24" (60cm) color graphic touch-screen monitor and PC	x
Windows®-based operating system	x
Wi-Fi network connectivity	x
Video edge detection	x
X-Y-Z measurements*	x
2D geometric constructs plus height	x
FOV measurements integrated with X-Y stage motion	x
CAD file import and export	x
Automatic comparison of measurements to CAD files**	x
Software developer	MetLogix™

\*X-Y-Z measurements only available when configured with 3-axis option.

\*\*Only available when equipped with M3 Digital Comparator module in FOV models.

### MVR DIMENSIONS





# AUTOMATIC VISION METROLOGY SYSTEMS

## AVR

### AVR200 AND AVR300

The AVR CNC Automatic Vision Metrology Systems are ideal for repetitive measurements and automatic comparison to CAD files. Systems are available with interchangeable telecentric or dedicated zoom lenses for micron-level resolution and accurate field-of-view (FOV) measurements. With a maximum FOV of 0.93" (24mm), the AVR series is capable of measuring parts with a length up to 8" (200mm) or 12" (300mm) for the AVR 200 and 300, respectively. A large 2.36" (60mm) FOV-dedicated 0.14X lens is now available. The operator interface is the MetLogix™ M3 software that displays a live video image of the part plus geometry tools and digital readings. The image of the part can be resized using zoom and measurements can be taken by simply touching a feature on the touch-screen monitor. M3 software capabilities also include 3-axis measurements and 2D geometric constructs (points, lines, angles, rectangles, slots, blobs). Systems are also touch probe compatible.

### FEATURES AND SPECIFICATIONS

- Z travel: 8" (200 mm)
- Full CNC X-Y-Z positioning or motorized manual positioning using a pendant with joystick and trackball
- Metlogix™ M3 metrology software
- Video edge detection (VED)
- Field-of-view (FOV) measurements integrated with stage motion
- Renishaw scales for 4μin (0.1μm) of X,Y and Z axis (available on select models)
- Color digital video camera
- Collimated LED sub-stage illumination
- Ring light LED surface illumination (dome light on FOV 0.14)
- Granite base



Renishaw touch probe option with calibration ring gauge

Click the QR code to view the AVR Series



### OPTIONS

- Dedicated 6.5:1 or 12:1 CNC zoom optics
- Quick-change bayonet or fixed lens mount for telecentric optics (AVR-FOV 0.14 Model shown at right)
- Interchangeable bayonet mount lenses - 0.30x, 0.50x, 0.80x, 1.0x, 2.0x, 4.0x telecentric optics and 6.5-1 manual zoom lens
- 0.5x, 1.5x and 2.0x auxiliary lenses for zoom optics
- Renishaw touch probe kit
- 2 or 4 Bay touch probe change rack
- Programmable darkfield quadrant LED surface illumination for zoom optics
- DXF/FOV option for automatic comparison to CAD files
- Modular system workstation
- Calibration standards
- Part fixtures and work holding devices
- Thread measurement software module
- CNC rotary axis fixture (see page 25)

AVR200



AVR-FOV 0.14

### AVR Optics

Optical Parameters	Telecentric Optics						AVR-FOV Models Interchangeable 6.5:1 Zoom Optics	Standard AVR Models Dedicated 12:1 Zoom Optics	AVR-FOV 0.14 Telecentric Optics
Optical magnification on CCD	0.30x	0.50x	0.80x	1.0x	2.0x	4.0x	0.47x to 3.0x	0.4x to 4.7x	0.14x
Total magnification on monitor	13x	22x	36x	45x	89x	178x	31x to 198x	26x to 310x	4.7x
Field of view width	0.93" (24mm)	0.55" (14mm)	0.35" (8.9mm)	0.27" (7mm)	0.14" (3.5mm)	0.07" (1.8mm)	0.39" to 0.06" (10 to 1.6mm)	0.47" to 0.04" (12 to 1mm)	2.36" (60mm)
Field of view height	0.76" (19mm)	0.45" (11mm)	0.29" (7.4mm)	0.22" (5.6mm)	0.12" (3mm)	0.06" (1.5mm)	0.32" to 0.05" (8.1mm to 1.3mm)	0.39" to 0.03" (10mm to 0.76mm)	1.9" (48mm)
Working distance	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	3.47" (88mm)	3.47" (88mm)	4.3" (110mm)
Camera CCD	1/1.8"	1/1.8"	1/1.8"	1/1.8"	1/1.8"	1/1.8"	1/1.8" (2MP)	1/3" (1.3MP)	2/3" (6MP)

### Specifications

	AVR200	AVR300
Net Weight	145lbs 66kg	225lbs 102kg
Shipping Weight	250lbs 115kg	300lbs 135kg
Dimensions (H x W x D)	34" x 20.5" x 27" 863mm x 520mm x 685mm	34" x 29.2" x 35" 865mm x 740mm x 890mm
X-Y-Z Travel*	8" x 4" x 8" 200mm x 100mm x 200mm	12" x 8" x 8" 300mm x 200mm x 200mm
X-Y Accuracy**	E2= 1.9µm + 5L/1000	E2= 1.9µm + 5L/1000
Z Accuracy**	E1= 2.5µm + 5L/1000	E1= 2.5µm + 5L/1000

\*Z value only applicable when configured with 3-axis option.

\*\*X-Y-Z specific accuracies are dependent on lens configuration setup.

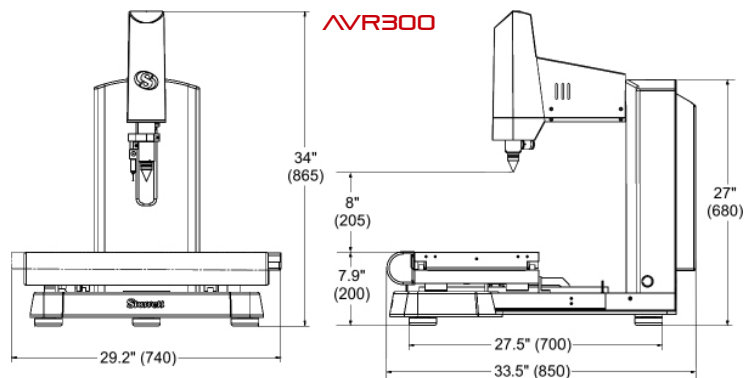
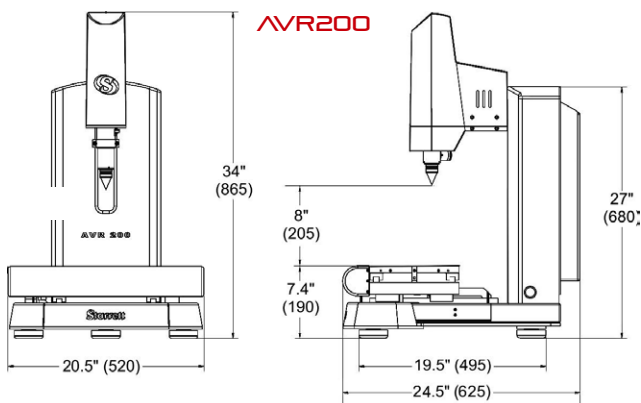
### Operator Interface

Feature	All-in-One PC with M3 DXF/FOV Software
24" (60cm) color graphic touch-screen monitor and PC	x
Integrated motion control unit	x
Windows®-based operating system	x
Wi-Fi network connectivity	x
Video edge detection	x
X-Y-Z measurements*	x
2D geometric constructs plus height	x
FOV measurements integrated with X-Y stage motion	x
CAD file import and export	x
Automatic comparison of measurements to CAD files**	x
Software developer	MetLogix™

\*X-Y-Z measurements only available when configured with 3-axis option.

\*\*Only available when equipped with M3 Digital Comparator module in FOV models.

### AVR DIMENSIONS





# AUTOMATIC VISION METROLOGY SYSTEMS

## AV

### AV350 AND AV450

Offering similar attributes and performance to the AVR300 with an expanded measurement envelope of up to 18" x 14" x 8" (450mm x 350mm x 200mm) X-Y-Z measuring range for those larger part and payload measurement requirements. Systems are available with vision, touch probe, and rotary fixtures.

#### FEATURES AND SPECIFICATIONS

- 12:1 dedicated or 6.5:1 interchangeable zoom optics
- Precision granite base construction
- System stand and control cart standard
- Metlogix M3™ software
- Video edge detection (VED)
- Field-of-view (FOV) measurements integrated with stage motion
- Renishaw scales for 4µin (0.1µm) of X,Y and Z axis (available on select models)
- Ring light LED surface illumination

#### OPTIONS

- 0.5x, 1.5x and 2.0x auxiliary lenses for zoom optics
- Quadrant LED surface illumination for zoom optics
- Renishaw touch probe kit
- FOV version with interchangeable telecentric lenses available
- 2 or 4 bay touch probe change rack compatible
- CNC rotary axis fixture (see page 25)
- Calibration standards
- Part fixtures and work holding devices



Click the QR code to view the AVR Series





## AV Optics

Optical Parameters	Telecentric Optics						AVR-FOV Models Interchangeable 6.5:1 Zoom Optics	Standard AVR Models Dedicated 12:1 Zoom Optics
Optical magnification on CCD	0.30x	0.50x	0.80x	1.0x	2.0x	4.0x	0.47x to 3.0x	0.4x to 4.7x
Total magnification on monitor	13x	22x	36x	45x	89x	178x	31x to 198x	26x to 310x
Field of view width	0.93" (24mm)	0.55" (14mm)	0.35" (8.9mm)	0.27" (7mm)	0.14" (3.5mm)	0.07" (1.8mm)	0.39" to 0.06" (10mm to 1.6mm)	0.47" to 0.04" (12mm to 1 mm)
Field of view height	0.76" (19mm)	0.45" (11mm)	0.29" (7.4mm)	0.22" (5.6mm)	0.12" (3mm)	0.06" (1.5mm)	0.32" to 0.05" (8.1mm to 1.3mm)	0.39" to 0.03" (10mm to 0.76mm)
Working distance	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	3.47" (88mm)	3.47" (88mm)
Camera CCD	1/1.8"	1/1.8"	1/1.8"	1/1.8"	1/1.8"	1/1.8"	1/1.8"	1/3"

## Specifications

	AV350	AV450
Net Weight	409lbs 185kg	409lbs 185kg
Shipping Weight	1,300lbs 591kg	1,300lbs 591kg
Cart Weight	100lbs 45kg	100lbs 45kg
X-Y-Z Travel*	14" x 14" x 8" 350mm x 350mm x 200mm	18" x 14" x 8" 450mm x 350mm x 200mm
X-Y Accuracy (µm)**	E2 = 2.5µm + 5L/1000	E2 = 2.5µm + 5L/1000
Z Accuracy (µm)**	E1 = 2.5µm + 5L/1000	E1 = 2.5µm + 5L/1000

\*Z value only applicable when configured with 3-axis option.

\*\*X-Y-Z specific accuracies are dependent on lens configuration setup.

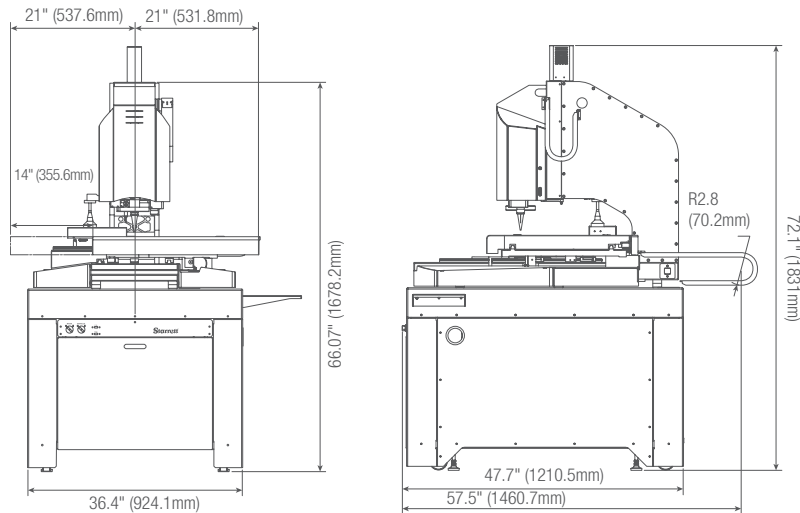
## Operator Interface

Feature	All-in-One PC with M3 DXF/FOV Software
24" (60cm) color graphic touch-screen monitor and PC	x
Integrated motion control unit	x
Windows®-based operating system	x
Wi-Fi network connectivity	x
Video edge detection	x
X-Y-Z measurements*	x
2D geometric constructs plus height	x
FOV measurements integrated with X-Y stage motion	x
CAD file import and export	x
Automatic comparison of measurements to CAD files**	x
Software developer	MetLogix™

\*X-Y-Z measurements only available when configured with 3-axis option.

\*\*Only available when equipped with M3 Digital Comparator module in FOV models.

## AV350 / AV450 DIMENSIONS





# AUTOMATIC VISION METROLOGY SYSTEMS

## LARGE FORMAT AVX

### AVX550

Our AVX machines offer a larger format X-Y-Z travel: 22" x 16" x 10" (550mm x 400mm x 250mm). New to the AVX is the option to configure dual camera inputs, allowing the user to make measurements on both the macro and micro levels with one system without changing lenses or re-calibrating. Ideal for use in QC labs, research, engineering, or manufacturing environments where large parts with many intricate features need inspection. AVX models utilize linear guide X-Y transport for ultra-smooth, high speed positioning and are driven by precision lead screws and servo motors.

#### FEATURES AND SPECIFICATIONS

- Transports are driven by hi-speed, low maintenance, precision mechanical linear bearings.
- Substantial granite base and bridge for superior machine stability and precision
- MetLogix™ M3 Software
- 24" touchscreen PC
- LED Surface Ring Illumination
- LED Transmitted Illumination
- LED Coaxial Illumination
- Digital Video Color Camera: 1.3 MP, 1/3" SXVGA sensor

#### OPTIONS

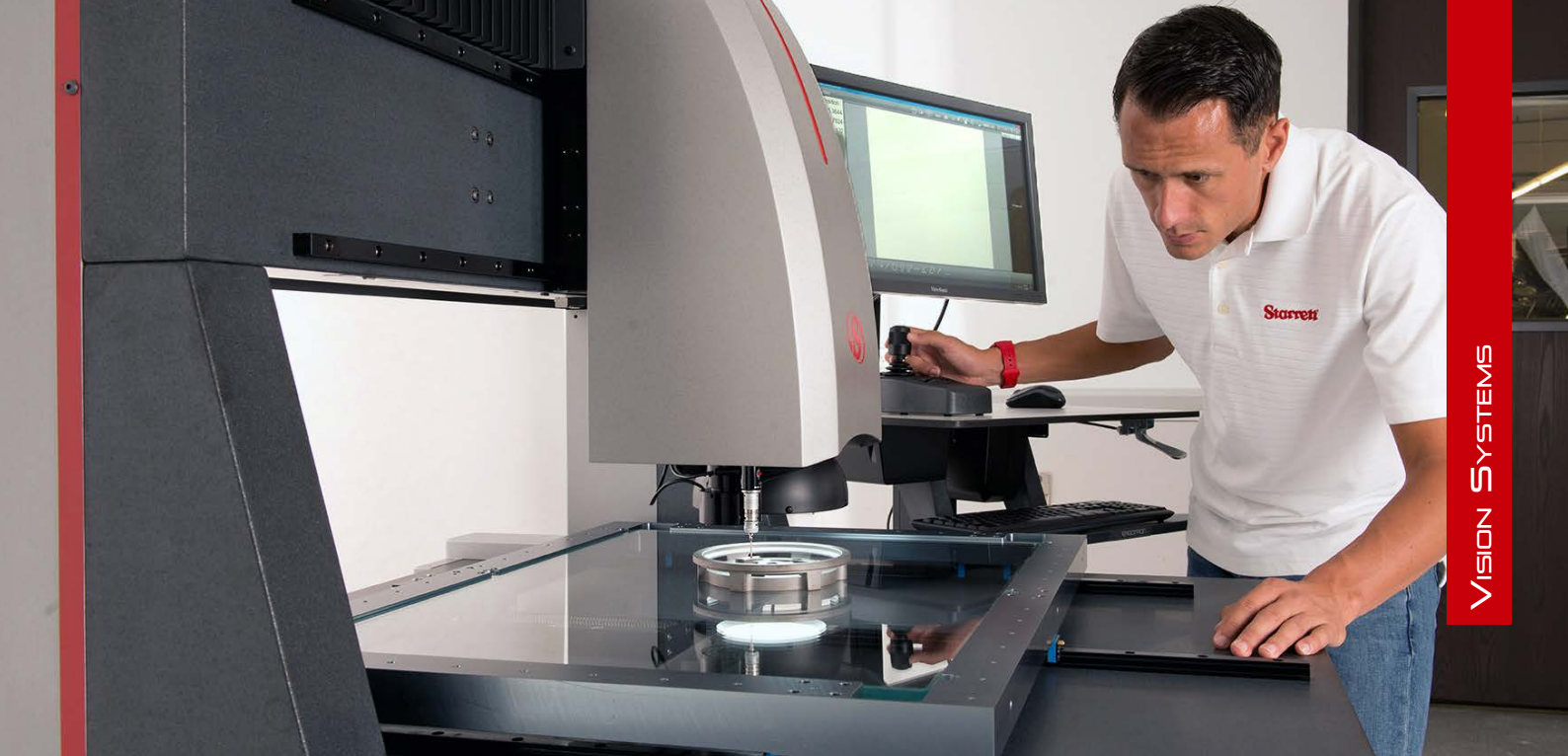
- Choice of dual camera inputs
- Dedicated 12:1 CNC zoom optics
- 0.5x, 1.5x and 2.0x auxiliary lenses for zoom optics
- Quadrant LED surface illumination
- DXF/FOV option for automatic comparison to CAD designs
- Adjustable ergonomic workstation including a compact control panel and standard keyboard
- CNC rotary axis fixture
- Renishaw touch probe kit
- Renishaw probe changing rack
- Calibration standards
- Part fixtures and work holding devices

AVX550



Click the QR code to view the AVX





## AVX Optics

System Parameter	Telecentric Lenses							AVX Dedicated 12:1 Zoom Optics
Optical magnification	0.14x	0.30x	0.50x	0.80x	1.0x	2.0x	4.0x	0.4x to 4.7x
Magnification on 24" monitor	4.7x	10x	16.4x	27x	33x	69x	137x	26x to 310x
Field of view width	2.36" (60mm)	1.1" (28mm)	0.67" (17mm)	0.41" (10.5mm)	0.33" (8.4mm)	0.16" (4.2mm)	0.08" (2.1mm)	0.47" to 0.04" (12mm to 1mm)
Field of view height	2.0" (51mm)	0.94" (24mm)	0.56" (14mm)	0.35" (8.9mm)	0.28" (7.1mm)	0.14" (3.7mm)	0.07" (1.8mm)	3.47" (88mm)
Working distance	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	1/3"

## Specifications

	AVX
Net Weight	1360lbs (617kg)
Shipping Weight	1720lbs (782kg)
Cart Weight	91lbs (41.3 kg)
Dimensions (H x W x D)	78" x 40.4" x 41.3" (1980mm x 1025mm x 1050mm)
X-Y-Z Travel	22" x 16" x 10" (550mm x 400mm x 250mm)
X-Y Accuracy	E2 = 2.5µm + 5L/1000
Z Accuracy	E1 = 2.5µm + 5L/1000

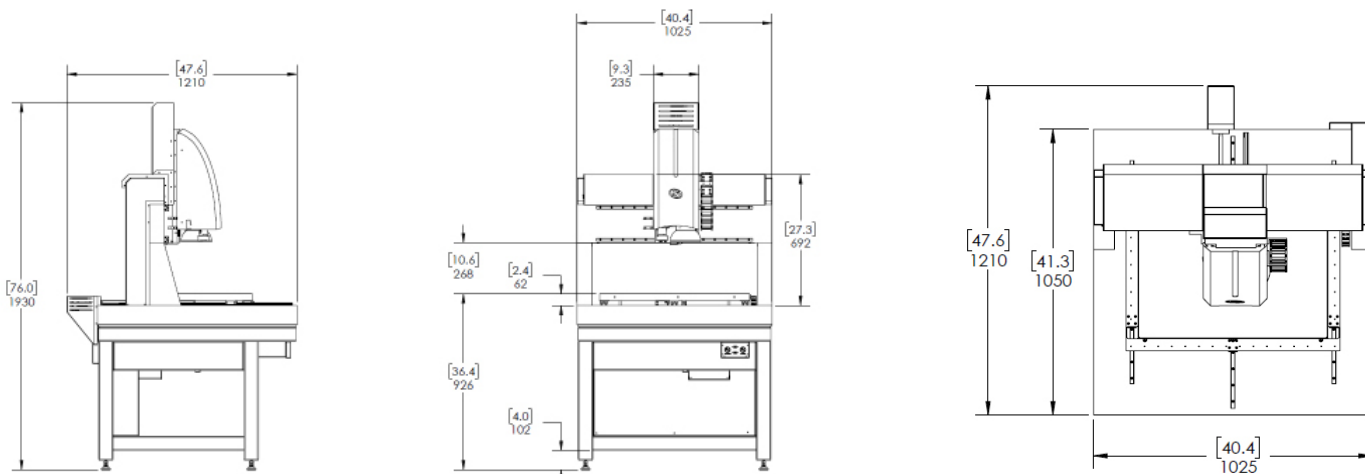
## Operator Interface

Feature	All-in-One PC with M3 DXF/FOV Software
24" (60cm) color graphic touch-screen monitor and PC	x
Integrated motion control unit	x
Windows®-based operating system	x
Wi-Fi network connectivity	x
Video edge detection	x
X-Y-Z measurements*	x
2D geometric constructs plus height	x
FOV measurements integrated with X-Y stage motion	x
CAD file import and export	x
Automatic comparison of measurements to CAD files**	x
Software developer	MetLogix™

\*X-Y-Z measurements only available when configured with 3-axis option.

\*\*Only available when equipped with M3 Digital Comparator module in FOV models.

## AVX DIMENSIONS





# HORIZONTAL DIGITAL VIDEO COMPARATORS

## HDV

### HDV300 AND HDV400 BENCH-TOP SYSTEMS

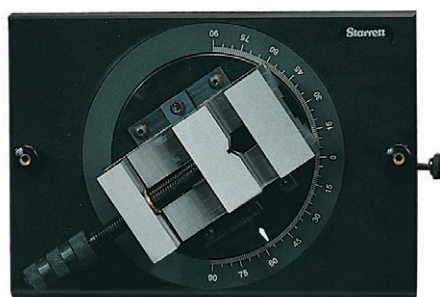
The HDV Horizontal Digital Video Comparators combine the best features of a horizontal optical comparator and a vision metrology system. The HDV is configured like a traditional horizontal comparator. The workstage is the same as the Starrett field-proven comparators. The heart of the HDV system centers on a uniquely patented designed interchangeable lens mounting system coupled to a hi-resolution 5 mega-pixel digital video camera. The system is available with a choice of seven telecentric lenses for micron-level resolution and optical distortion as low as 0.001% for accurate field-of-view (FOV) measurements. With MetLogix™ M3 software, DXF CAD files can be imported and 2D Go/No-Go digital overlays can be developed directly from the CAD files. Video edge detection (VED) allows real-time interaction of the imported file with the video image of the part being inspected. Productivity, speed and accuracy are all enhanced. Systems are available in manual or CNC control.

#### FEATURES AND SPECIFICATIONS

- Steel and aluminum construction with hard anodized stage tooling plate and riser
- 21.3" x 5.1" (540mm x 130mm) workstage
- 110lbs (50kg) maximum load capacity
- 2" (51mm) of focus travel
- Manual X-Y and focus positioning via hand wheels or CNC with joystick and trackball positioning
- Heidenhain glass scales for 20µin (0.5µm) X and Y resolution
- LED illumination for surface and profile lighting
- 5 mega-pixel color video camera (2448 x 2058 pixels)
- Software and part image displayed on 24" (60cm) touch-screen color monitor (1920 x 1080 pixels)

#### OPTIONS

- 6 interchangeable telecentric lenses for fields of view from 1.14" to 0.09" (29mm to 2.3mm) (patent US 9,360,435 B2)
- Interchangeable 6.5:1 zoom optics
- Systems are also available with fixed 0.14x lens offering 2.5" x 1.9" (63mm x 47mm) FOV. (Lenses are not interchangeable on this model)
- MetLogix™ M3 software with DXF/FOV, Profile Fitting and Thread Measurement Modules
- Optional CNC controls
- 22" or 31" purpose built cabinet stands
- Extensive line of calibration standards, work-holding devices and accessories
- Swing-away lamp house



Rotary Vise with 1-1/4" Capacity

Click the QR code to view the HDV Series



HDV400 CNC



### HDV300/400 Optics

System Parameter	Telecentric Lenses							6.5:1 Zoom Lens
Optical magnification	0.14x	0.30x	0.50x	0.80x	1.0x	2.0x	4.0x	0.7x to 4.5x
Magnification on 24" monitor	4.7x	10x	16.4x	27x	33x	69x	137x	58x to 363x
Field of view width	2.36" (60mm)	1.1" (28mm)	0.67" (17mm)	0.41" (10.5mm)	0.33" (8.4mm)	0.16" (4.2mm)	0.08" (2.1mm)	0.47" to 0.74" (12mm to 18.8mm)
Field of view height	2.0" (51mm)	0.94" (24mm)	0.56" (14mm)	0.35" (8.9mm)	0.28" (7.1mm)	0.14" (3.7mm)	0.07" (1.8mm)	0.40" to 0.62" (10.1mm to 15.7mm)
Working distance	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	3.5" (88mm)

### Specifications

	HDV300	HDV400
Net Weight	220lbs 100kg	230lbs 105kg
Shipping Weight	440lbs 200kg	440lbs 200kg
X-Y Travel	12" x 6" 300mm x 150mm	16" x 6" 400mm x 150mm
X-Y Accuracy	E2 = 3.0 µm + L/33	E2 = 3.0 µm + L/33

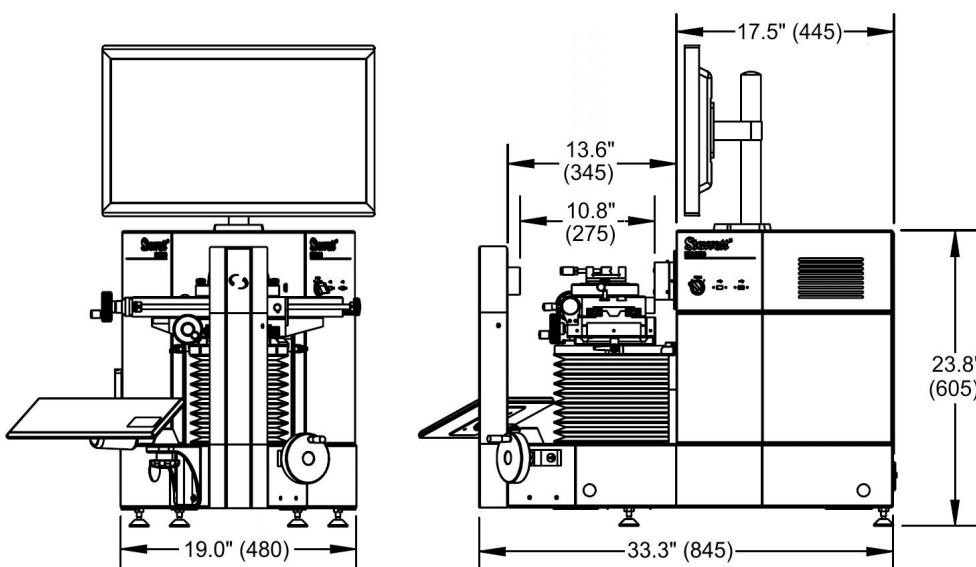
### Operator Interface

Feature	All-in-One PC with M3 DXF/FOV Software
24" (60cm) color graphic touch-screen monitor and PC	x
Integrated motion control unit	x
Windows®-based operating system	x
Wi-Fi network connectivity	x
Video edge detection	x
X-Y-Q (angle) measurements*	x
2D geometric constructs plus height	x
FOV measurements integrated with X-Y stage motion	x
CAD file import and export	x
Automatic comparison of measurements to CAD files**	x
Software developer	MetLogix™

\*X-Y-Z measurements only available when configured with 3-axis option.

\*\*Only available when equipped with M3 Digital Comparator module in FOV models.

### HDV300 / HDV400 DIMENSIONS





# HORIZONTAL DIGITAL VIDEO COMPARATORS

## HDV

### HDV500 CNC FLOOR STANDING

The HDV500 CNC Digital Video Comparator offers the best features of a large, floor standing, horizontal optical comparator and a vision metrology system. The HDV500 has a long 20" x 8" (500mm x 200mm) X-Y stage and heavy-duty steel construction. The workstage is the same as the popular HF600 and HF750. The heart of the HDV system centers on a uniquely designed interchangeable lens mounting system (patent pending) to a hi-resolution 5 mega-pixel digital video camera. The HDV500 is available with a choice of three telecentric lens options for micron-level resolution and for accurate Field-of-View (FOV) measurements. With MetLogix™ M3 Metrology software, DXF CAD files can be imported and 2D Go-No-Go digital overlays can be developed directly from the CAD files. Video edge detection (VED) allows real-time interaction of the imported file with the video image of the part being inspected. Productivity speed and accuracy are all enhanced.

### FEATURES AND SPECIFICATIONS

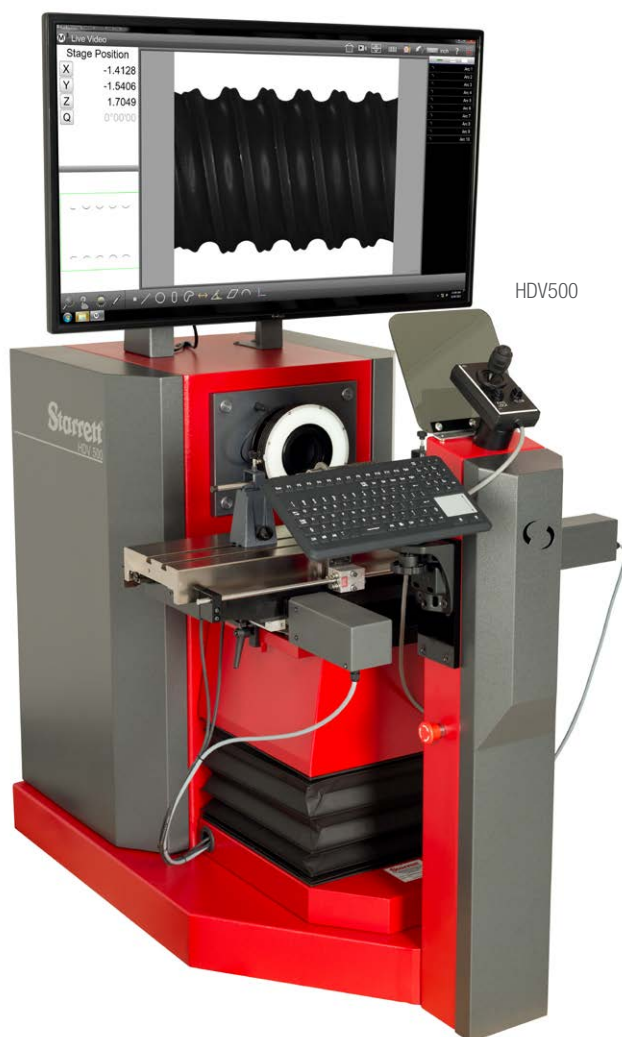
- Steel construction with nickel plated stage tooling plate
- 21.3" x 5.1" (540 x 130mm) workstage top plate
- CNC controls
- 330lb (150kg) maximum load capacity
- 3" (75mm) of focus travel
- Helix angle adjustment with  $\pm 15^\circ$  Vernier scale
- X-Y and focus positioning via joystick and trackball positioning
- Heidenhain glass scales for 20 $\mu$ m (0.5 $\mu$ m) X and Y resolution
- LED illumination for surface and profile lighting
- 5 mega-pixel black and white digital video camera (2448 x 2058 pixels)
- Floor standing model

### OPTIONS

- 6.5:1 zoom optics interchangeable
- 3 interchangeable telecentric lenses for fields of view including- 1.4" x 1.1" (34.7mm x 29mm), 2.1" x 1.7" (53.8mm x 45mm), and 3.0" x 2.5" (76.5mm x 64mm). Patent pending.
- MetLogix™ Profile Fitting and Thread Measurement software
- Extensive line of accessories, workholding devices and calibration standards
- APT60, 120 or 200 rotary indexing table (see page 25)



Click the QR code to view the HDV500



HDV500



#### Operator Interface

Feature	All-in-One PC with M3 DXF/FOV Software
42" (1070cm) color graphic monitor and PC (installed in main housing)	x
Integrated motion control unit	x
Windows®-based operating system (1080 pixels)	x
Wi-Fi network connectivity	x
Video edge detection	x
X-Y-Q (angle) measurements*	x
2D geometric constructs plus height	x
FOV measurements integrated with X-Y stage motion	x
CAD file import and export	x
Automatic comparison of measurements to CAD files**	x
Software developer	MetLogix™

\*X-Y-Z measurements only available when configured with 3-axis option.

\*\*Only available when equipped with M3 Digital Comparator module in FOV models.

#### HDV500 Optics

System Parameter	Telecentric Lenses			6.5:1 Zoom Lens
Optical magnification	0.11x	0.16x	0.24x	0.7x to 4.5x
Magnification on 42" monitor**	6.5x	9.3x	14.7x	41x* to 262x*
Field of view width	3.0" (76.5mm)	2.1" (53.8mm)	1.3" (34.7mm)	47" to 0.40" (12mm to 10mm)
Field of view height	2.5" (64mm)	1.7" (45mm)	1.1" (29mm)	0.46" to 0.072" (11.7mm to 1.8mm)
Working distance	9.0" (228mm)	6.3" (159mm)	6.0" (150mm)	5.5" (140mm)

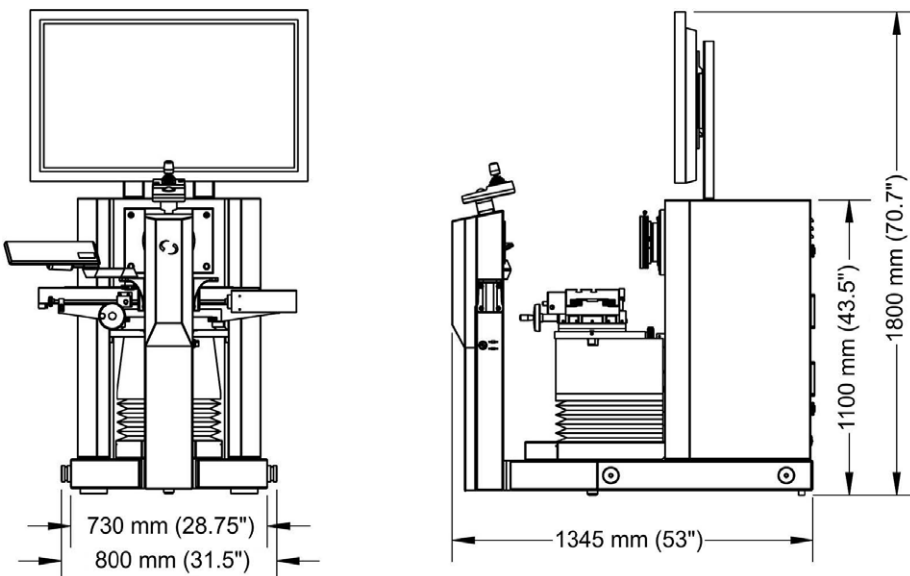
\*Best fit software setting

\*\*Note that screen magnification is variable based on setting in M3 software

#### Specifications

Net Weight	1330lbs (600kg)
Shipping Weight	1400lbs (635kg)
X-Y Travel	20" x 8" (500mm x 200mm)
X-Y Accuracy	E2 = 3.0 µm + L/33

#### HDV500 DIMENSIONS





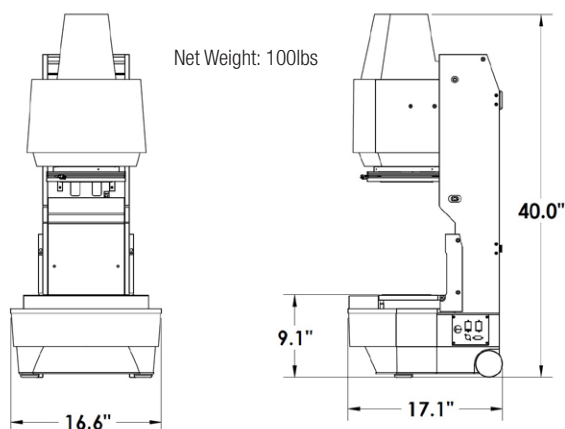
# HVR100 FLIP

## HVR

The HVR-Flip from Starrett is the latest in a line of large field of view video-based measurement systems. The HVR-Flip has the unique characteristic of being used in either a vertical or horizontal format offering tremendous versatility and value.

Operator Interface	
Feature	MetLogix™ M3 DXF/FOV
24" color graphics touch screen	x
Windows®-based operating system	x
X-Y-Q (angle) measurements	x
2D geometry software with skew	x
Video edge detection	x
CAD file import and export	x
FOV measurements	x
Elimination of overlays	x
64-bit Intel® processor	x
Software developer	MetLogix™

Specifications	
Field of View	3.65" x 3.0" (92.7mm x 76.2mm)
Field of View Accuracy	Within 0.010mm
Optical Magnification	0.090X
Total Magnification on Monitor	3X
Working Distance	10" (254mm)
Camera	5MP 2/3" CCD Monochromatic
Lighting	LED
Software	MetLogix™ M3 on Windows® operating system
Net Weight of HVR	100 lbs (45.5 kg)
Shipping Weight - all components crated	206 lbs (93.4 kg)
Shipping crate dimensions	48" x 26" x 31" (122cm x 66cm x 78cm)



### FEATURES

- Rapidly measure parts up to 3.65" x 3" (92.7mm x 76.2mm)
- Working distance of 10" (254mm)
- Measure a single feature, an entire part, or multiple parts
- MetLogix™ M3 software allows for easy one-touch feature measurement
- Auto-detect part recognition
- DXF Import - electronic overlay for quick part comparison
- Export features to DXF
- Compare complex profiles with discreet data points and comparison to CAD
- Graphic based "Part View" constructions
- Geometric tolerancing
- Flexible report content and formatting
- Multi-language support
- Optional software modules:
  - Profile fitting
  - Wire insulation
  - Thread measurement
- System can be easily converted from a vertical format to a horizontal format measuring system

Click the QR code to view the HVR100



# CUSTOM VISION SYSTEMS

## CUSTOM SOLUTIONS

Starrett stands out from other optical and vision system providers through our willingness to work directly with customers to design and manufacture custom tools for applications where standard products cannot perform.

We approach each application with a wide range of excellent products, accessories and expertise. If necessary, we will take the additional step of developing original, customized solutions.

Whatever it takes, we will work with you to configure a system that is just right for your requirements. As a company, Starrett has provided solutions to industries including energy, aerospace, automotive, food packaging, high-technology, plastics, medical components, and to NASA and other government agencies over a period of many years.

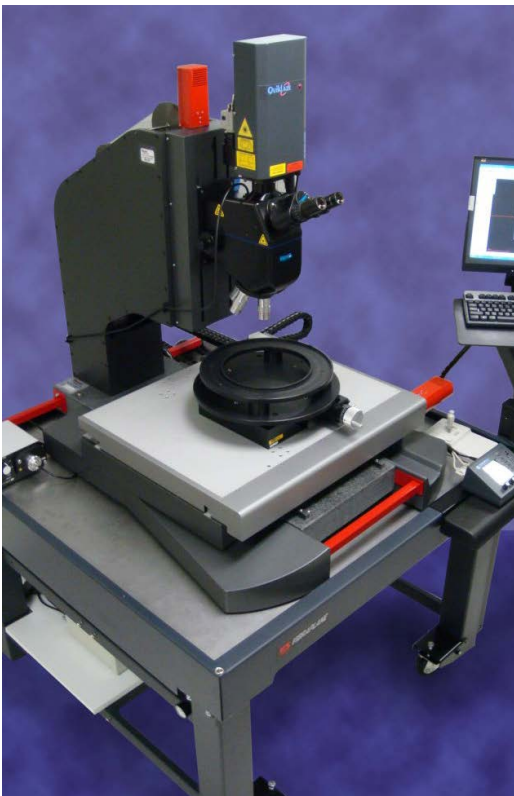
Through design, testing, product specification and system development, we will create a solution that meets your unique requirements.



▲ FROM PROBLEM  
▲ TO INNOVATION  
▲ TO SOLUTION

Have a special measurement requirement? Let our application engineering team assist with a solution. Please contact us with your requirements.  
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Custom laser ablation system built on AV350 platform.



AV Series system customized with special microscope optics for wafer application.



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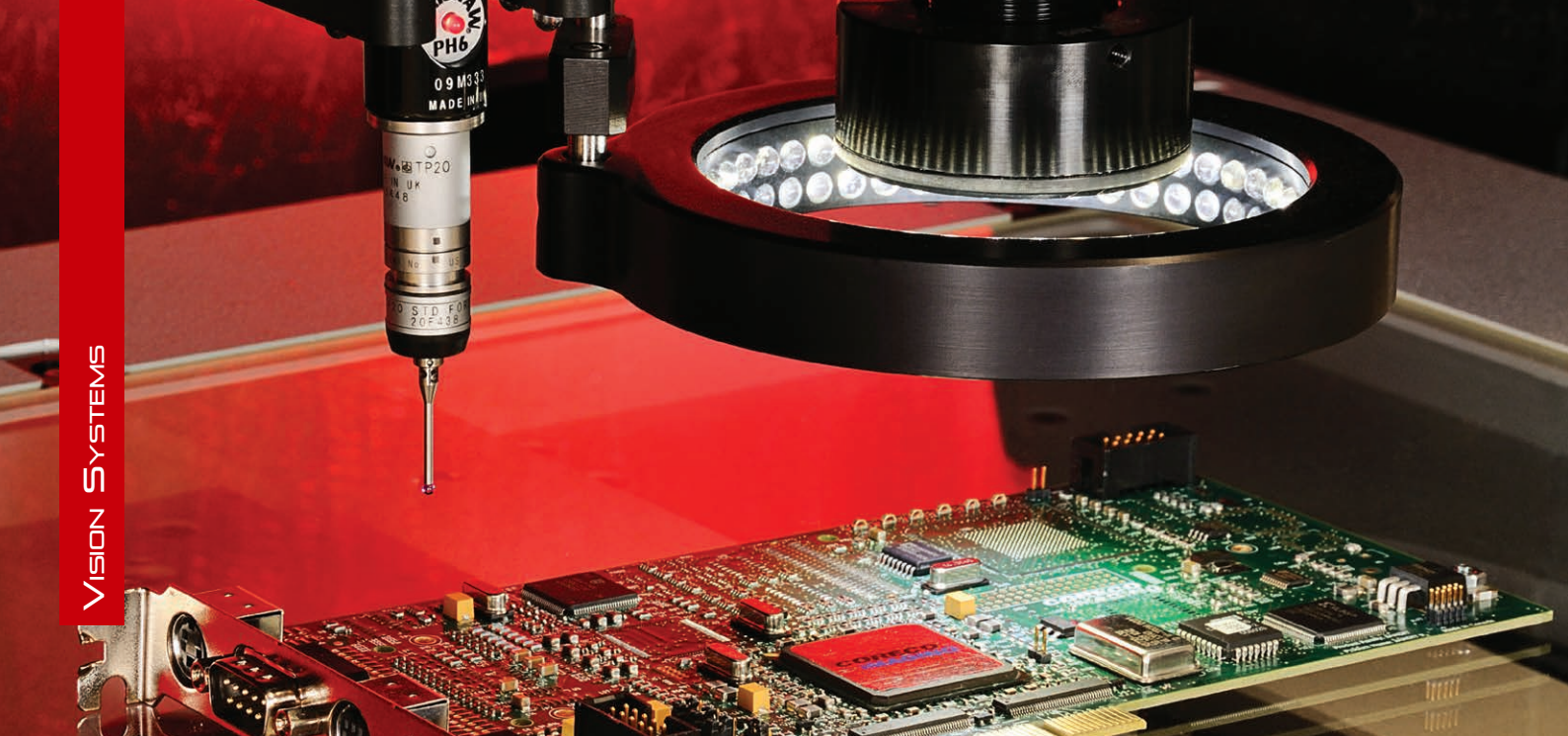


# SPECIFICATIONS AND OPTIONS

Model	MVR200	MVR300	AVR200	AVR300	AV350
Bench-Top System	X	X	X	X	—
Floor-Standing System	—	—	—	—	X
Part View Orientation	Vertical	Vertical	Vertical	Vertical	Vertical
X-Y-Z Travel (in)	8" x 4" x 8"	12" x 8" x 8"	8" x 4" x 8"	12" x 8" x 8"	14" x 14" x 8"
X-Y-Z Travel (mm)	200mm x 100mm x 200mm	300mm x 200mm x 200mm	200mm x 100mm x 200mm	300mm x 200mm x 200mm	350mm x 350mm x 200mm
Z Axis Measuring	Optional	Optional	Standard	Standard	Standard
CNC	—	—	Standard	Standard	Standard
X-Y Accuracy (μm)	E2 = 2.5μm + 5L/1000	E2 = 2.5μm + 5L/1000	E2 = 1.9μm + 5L/1000	E2 = 1.9μm + 5L/1000	E2 = 2.5μm + 5L/1000
Z Accuracy (μm)	E1 = 2.5μm + 5L/1000	E1 = 2.5μm + 5L/1000	E1 = 2.5μm + 5L/1000	E1 = 2.5μm + 5L/1000	E1 = 2.5μm + 5L/1000
Scale Resolution	20μin (0.5μm)	20μin (0.5μm)	4μin (0.1μm)	4μin (0.1μm)	4μin (0.1μm)
Multi-Sensor Compatible	—	—	Yes	Yes	Yes
Base	Granite	Granite	Granite	Granite	Granite
Control System/Software	M3	M3	M3	M3	M3
Display	24" Touchscreen PC	24" Touchscreen PC	24" Touchscreen PC	24" Touchscreen PC	24" Touchscreen PC
Zoom Optics - Standard	6.5:1	6.5:1	6.5:1 - 2 LED 12:1 - 3 LED	6.5:1 - 2 LED 12:1 - 3 LED	12:1
Zoom Optics - Optional	—	—	—	—	—
Telecentric Optics	On FOV models, choice of 0.3x, 0.5x, 0.8x, 1.0x, 2.0x, 4.0x interchangeable Telecentric Lenses Optional- 0.14x fixed	On FOV models, choice of 0.3x, 0.5x, 0.8x, 1.0x, 2.0x, 4.0x interchangeable Telecentric Lenses Optional- 0.14x fixed	On FOV models, choice of 0.3x, 0.5x, 0.8x, 1.0x, 2.0x, 4.0x interchangeable Telecentric Lenses Optional- 0.14x fixed	On FOV models, choice of 0.3x, 0.5x, 0.8x, 1.0x, 2.0x, 4.0x interchangeable Telecentric Lenses Optional- 0.14x fixed	On FOV models, choice of 0.3x, 0.5x, 0.8x, 1.0x, 2.0x, 4.0x interchangeable Telecentric Lenses Optional- 0.14x fixed
Digital Video Camera	1.3 or 2.0 MP Color with Telecentric	1.3 or 2.0 MP Color with Telecentric	1.3 MP Color Standard; 2 MP with Telecentric	1.3 MP Color Standard; 2 MP with Telecentric	1.3, 2.0 MP Color (Lens dependent)
Surface Ring Illumination	LED	LED	LED	LED or Fiber Optic	LED or Fiber Optic
Transmitted Illumination	LED	LED	LED	LED or Fiber Optic	LED or Fiber Optic
Coaxial Illumination - Optional	LED	LED	LED	LED or Fiber Optic	LED or Fiber Optic
Auxiliary Lenses - Optional	0.5x, 1.5x, 2.0x	0.5x, 1.5x, 2.0x	0.5x, 1.5x, 2.0x	0.5x, 1.5x, 2.0x	0.5x, 1.5x, 2.0x
Rotary Fixture	—	—	Optional	Optional	Optional
Renishaw Touch Probe	—	—	Optional	Optional	Optional
Renishaw Touch Probe Change Rack	—	—	—	—	Optional
Dual Camera	—	—	—	—	—
Machine Pedestal and Point of Control Cart	—	—	—	—	Standard
Cabinet Stand	—	—	—	—	—
Workstation Base and extension	Optional	Optional	Optional	Optional	—
Part Fixturing	Optional	Optional	Optional	Optional	Optional
Dark Field Quadrant Illumination (LED only)	—	—	Optional	Optional	Optional
Video Pixel Calibration Standard	Optional	Optional	Optional	Optional	Optional
Calibration Standards	Optional	Optional	Optional	Optional	Optional
FOV, Linear and 2D Calibration Standards	Optional	Optional	Optional	Optional	Optional

	AV450	AVX	HVR100	HDV300	HDV400	HDV500
	—	—	X	X	X	—
	X	X	—	—	—	X
	Vertical	Vertical	Horizontal/Vertical	Horizontal	Horizontal	Horizontal
	18" x 14" x 8"	22" x 16" x 10"	—	12" x 6"	16" x 6"	20" x 8"
m	450mm x 350mm x 200mm	550mm x 400mm x 250mm	—	300mm x 150mm	400mm x 150mm	500mm x 200mm
	Standard	Standard	—	—	—	—
	Standard	Standard	—	Optional	Optional	Standard
	E2 = 2.5µm + 5L/1000	E2 = 2.5µm + 5L/1000	Within 0.010mm	E1 = 3.0µm + L33	E1 = 3.0µm + L/33	E1 = 3.0µm + L/33
	E1 = 2.5µm + 5L/1000	E1 = 2.5µm + 5L/1000	—	—	—	—
	4µin (0.1µm)	4µin (0.1µm)	—	20µin (0.5µm)	20µin (0.5µm)	20µin (0.5µm)
	Yes	Yes	—	—	—	—
	Granite	Granite	Aluminum	Steel	Steel	Steel
	M3	M3	M3 FOV	M3	M3	M3
	24" Touchscreen PC	24" Touchscreen PC	24" Touchscreen PC	24" Touch Screen PC	24" Touch Screen PC	42" Monitor
	12:1	12:1	—	—	—	—
	—	—	—	6.5:1	6.5:1	—
0.3x, 0.5x, 0.8x, 1.0x, 2.0x, 4.0x	On FOV models, choice of 0.3x, 0.5x, 0.8x, 1.0x, 2.0x, 4.0x interchangeable Telecentric Lenses Optional- 0.14x fixed	On FOV models, choice of 0.3x, 0.5x, 0.8x, 1.0x, 2.0x, 4.0x interchangeable Telecentric Lenses Optional- 0.14x fixed	0.90x	Choice of 0.3x, 0.5x, 0.8x, 1.0x, 2.0x, 4.0x interchangeable Telecentric Lenses Optional- 0.14x fixed	Choice of 0.3x, 0.5x, 0.8x, 1.0x, 2.0x, 4.0x interchangeable Telecentric Lenses Optional- 0.14x fixed	Choice of 0.11x, 0.16x, 0.24x interchangeable Telecentric Lenses
	1.3, 2.0 MP Color (Lens dependent)	1.3, 5.0 MP (Lens dependent)	5 MP Black and White	5 MP Color	5 MP Color	5 MP Black and White
	LED or Fiber Optic	LED	LED	LED	LED	LED
	LED or Fiber Optic	LED	—	LED	LED	LED
	LED or Fiber Optic	LED	—	—	—	—
	0.5x, 1.5x, 2.0x	0.5x, 1.5x, 2.0x	—	—	—	—
	Optional	Optional	—	Optional	Optional	Optional- Horizontal And vertical
	Optional	Optional	—	—	—	—
	Optional	Optional	—	—	—	—
	—	Optional	—	—	—	—
	Standard	Optional	—	—	—	—
	—	—	—	Optional	Optional	—
	—	—	Optional	—	—	—
	Optional	Optional	Optional	Optional	Optional	Optional
	Optional	Optional	—	—	—	—
	Optional	Optional	Optional	Optional	Optional	Optional
	Optional	Optional	Optional	Optional	Optional	Optional
	Optional	Optional	Optional	Optional	Optional	Optional

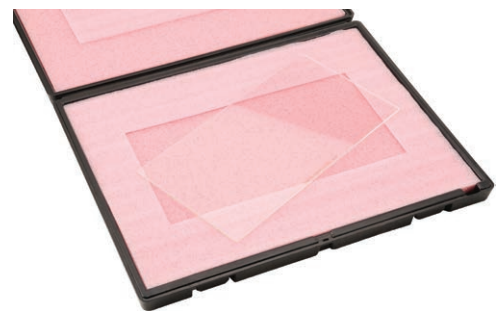




## ACCESSORIES



Workstations



NIST Traceable Calibration Standards

Renishaw Changer Rack



Click the QR code to  
view Inspection Arsenal



Touch Probe Kits



Part Holding Fixtures

Part Holding Fixtures provided in  
Collaboration with Inspection Arsenal  
[www.inspectionarsenal.com](http://www.inspectionarsenal.com)





## APT ROTARY STAGES: APT 60, 120, 200

Starrett vision systems now have three rotary options- the APT 60, APT 120 and APT 200. These stages provide numerous benefits including increased radial load stability and moment load rating. In addition, the rotary stages are ideal for positioning small cylindrical parts such shafts, cutting tools and threaded parts.

### APT 60 FEATURES

- Available on all CNC AV/AVR/HDV systems
- Great for positioning small cylindrical parts (shafts, cutting tools, threaded parts)
- Includes an axial load rating of 13 pounds (57.8N) and a radial load rating of 4.4 pounds (19.6N)
- Includes a 2.25-inch (57mm) diameter circular face
- Provides encoder resolution to 0.001 degrees
- Includes options for 1-inch (25mm) collet set or a 1.57-inch (40mm) collet set:
- The 1-inch (25mm) collet set holds parts up to 5/8-inches (16mm) in diameter
- The 1.57-inch (40mm) collet set holds parts up to one inch in diameter
- Can be paired with a tailstock and live center for greatly increased radial load stability
- Includes the option for 90-degree mounting bracket

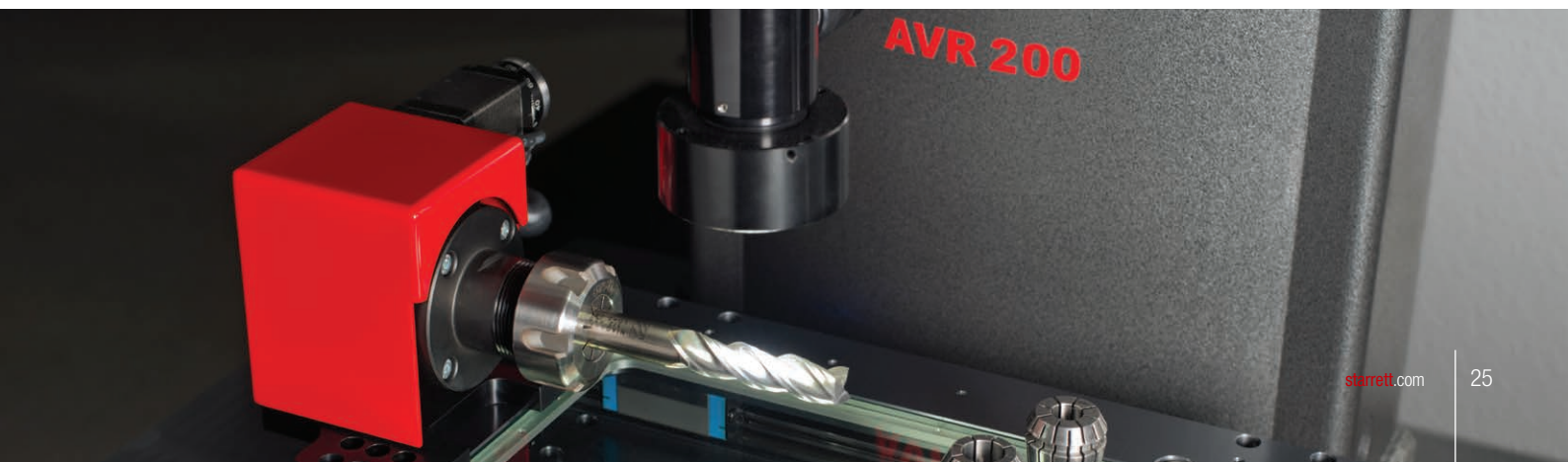
### APT120 FEATURES

- Available on the HDV 500 system
- Provides significantly increased moment load rating of 10.8-pound foot (14.7Nm)
- Includes an axial load rating of 33.7 pounds (150N)
- Includes a 3.82- inch (97 mm) diameter circular face
- Minimized runout (wobble) and radial runout of 10 microns
- Operates at a maximum speed of 300 rpm
- Includes the option for 90-degree mounting bracket

### APT 200 FEATURES

- Available on the HDV 500 system
- Provides significantly increased moment load rating of 40-pound foot (55.2Nm)
- Includes an axial load rating of 67 pounds (300N)
- Includes a 7-inch (182mm) diameter circular face
- Minimized runout (wobble) and radial runout of 10 microns
- Operates at a maximum speed of 300 rpm
- Includes the option for 90-degree mounting bracket

	APT60	APT120	APT 200
Rotational Accuracy	+5 arc minutes	+30 arc seconds	+30 arc seconds
Load Capacity, Axial	13lbs (57.8N)	33.7lbs (150N)	67lbs (300N)
Face Diameter	2.25" (57mm)	3.82" (97mm)	7" (182mm)
Maximum Speed (RPM)	10	300	300
Runout (μm)	10 (100 with collet set)	10	10
Rotary Stage Weight	2.7 lbs (1.2 kg)	16lbs(7kg)	23lbs (10kg)





# VIDEO INSPECTION SYSTEMS

## KMR-FOV 0.14

The KMR-FOV 0.14 video based inspection and measurement system is ideal for receiving inspection, quality assurance, training, manufacturing assembly, research and documentation - wherever easy setup and operation is required. M3 models offer Field-Of-View measurement, powerful image processing and DXF imports for direct comparison to the work piece for accurate and repeatable measurements.

### FEATURES & SPECIFICATIONS

- 0.14x Telecentric Lens
- Metlogix™ M3 software including Digital Comparator (DC)
- Color digital video camera
- PC with 24" touchscreen monitor
- LED ringlight and substage illumination
- Screen resolution 1920 x 1080
- Video edge detection

Our KMR systems line provide high performance for low cost. These machines are simple to operate without compromising performance.

With six models to choose from, we can customize to your specific needs.

Call (949) 348-1213 for an exact quote.

	KMR-FOV .14
Part Number	KMR-FOV-M3-0.14x
Optics	Telecentric Lens
CCD Sensor	5 M Pixel
Camera Interface	USB Cable
Computer	PC
Software	Metlogix™ M3
Video Screen	24" Touchscreen Monitor
Screen Resolution	1920 x 1080
Lens Magnification	0.14x
Screen Magnification	4.7x
Auxiliary lenses	N/A
Field of view (width x height)	2.36" x 2 " (60mm x 51mm)
X-Y Stage Motion	None
Metrology Means	M3 FOV Software
Measurement Resolution	Up to 3µm*
Meas. Accuracy	Up to ±3µm*
Basic Stand	Milled
Boom Stand	N/A
LED Back Light	Narrow Angle
LED Ring Light	Dome
Lighting Control	Via M3 Software
Video Inspection	Yes
Basic Dimensions	Yes, VED- FOV Stage Measurement
Geometric Constructs	Yes
Image Annotation	Yes
Image Archiving	Yes
Video Edge Detection	Yes

Click the QR code to  
view the KMR-FOV 0.14



# VIDEO INSPECTION SYSTEMS

## KMR 200

The KMR-200-M3 video based inspection and measurement system is ideal for receiving inspection, quality assurance, training, manufacturing assembly, research and documentation - wherever easy setup and operation is required but with an X and Y travel option where stage movement is required. M3 models offer Field-Of-View measurement, powerful image processing and DXF imports for direct comparison to the work piece for accurate and repeatable measurements.

### FEATURES & SPECIFICATIONS

- Precision 8" x 4" (200 x 100mm) XY stage
- Metlogix™ M3 software including Digital Comparator (DC)
- Color digital video camera
- PC with 24" touchscreen monitor
- 6.5:1 zoom lens
- LED ringlight and substage illumination
- Screen resolution 1920 x 1080
- Auxiliary lens 0.5x and 2x
- Video edge detection

	KMR 200
Part Number	KMR-200-M3
Optics	6.5:1 Zoom
CCD Sensor	1.33 M Pixel
Camera Interface	USB Cable
Computer	PC
Software	Metlogix™ M3
Video Screen	24" Touchscreen Monitor
Screen Resolution	1920 x 1080
Lens Magnification	0.7x to 4.5x Zoom Lens with magnification level feedback through M3 software.
Screen Magnification	31x to 200x
Auxiliary lenses	0.5x, 2x
Field of view width	0.055" to 0.35" (1.4mm to 9.0mm)
Field of view height	0.045" to 0.29" (1.1mm to 7.4mm)
X-Y Stage Motion	8" x 4" (200 x 100mm)
Z Travel	5" (125mm)
Metrology Means	X and Y Encoders
Measurement Resolution	0.5µm (0.00002")
Meas. Accuracy	2.5µm + 5L/1000
Basic Stand	Standard
Boom Stand	N/A
LED Back Light	Standard
LED Ring Light	Standard
Lighting Control	Via M3 Software
Video Inspection	Yes
Basic Dimensions	Yes, VED- FOV Stage Measurement
Geometric Constructs	Yes
Image Annotation	Yes
Image Archiving	Yes
Video Edge Detection	Yes

Click the QR code to view the KMR 200





# KMR VIDEO INSPECTION SYSTEMS

## KMR

KMR video measurement and inspection systems are a family of four versatile and affordable inspection and vision metrology systems. They are ideal for receiving inspection, quality assurance, training, manufacturing, assembly, research, and documentation – wherever easy setup and a range of magnifications are required. Depending on the size of the parts to be measured, measurements can be all electronic within the field of view, or be integrated with stage motion for parts up to 8" (200mm).

## FEATURES AND SPECIFICATIONS

- Metlogix™ M3 software including Digital Comparator (DC)
- Color digital video camera
- PC with 24" touchscreen monitor
- LED ringlight and substage illumination
- Screen resolution 1920 x 1080
- Video edge detection
- Equipped with 6.5:1 zoom lens or choice of 0.14x, 0.3x, 0.5x, or 1.0x telecentric lens
- Auxiliary lens options of 0.5x, 0.75x, 1.5x, 2x for use with 6.5:1 zoom option

Our KMR systems line provide high performance for low cost. These machines are simple to operate without compromising performance.

With six models to choose from, we can customize to your specific needs.

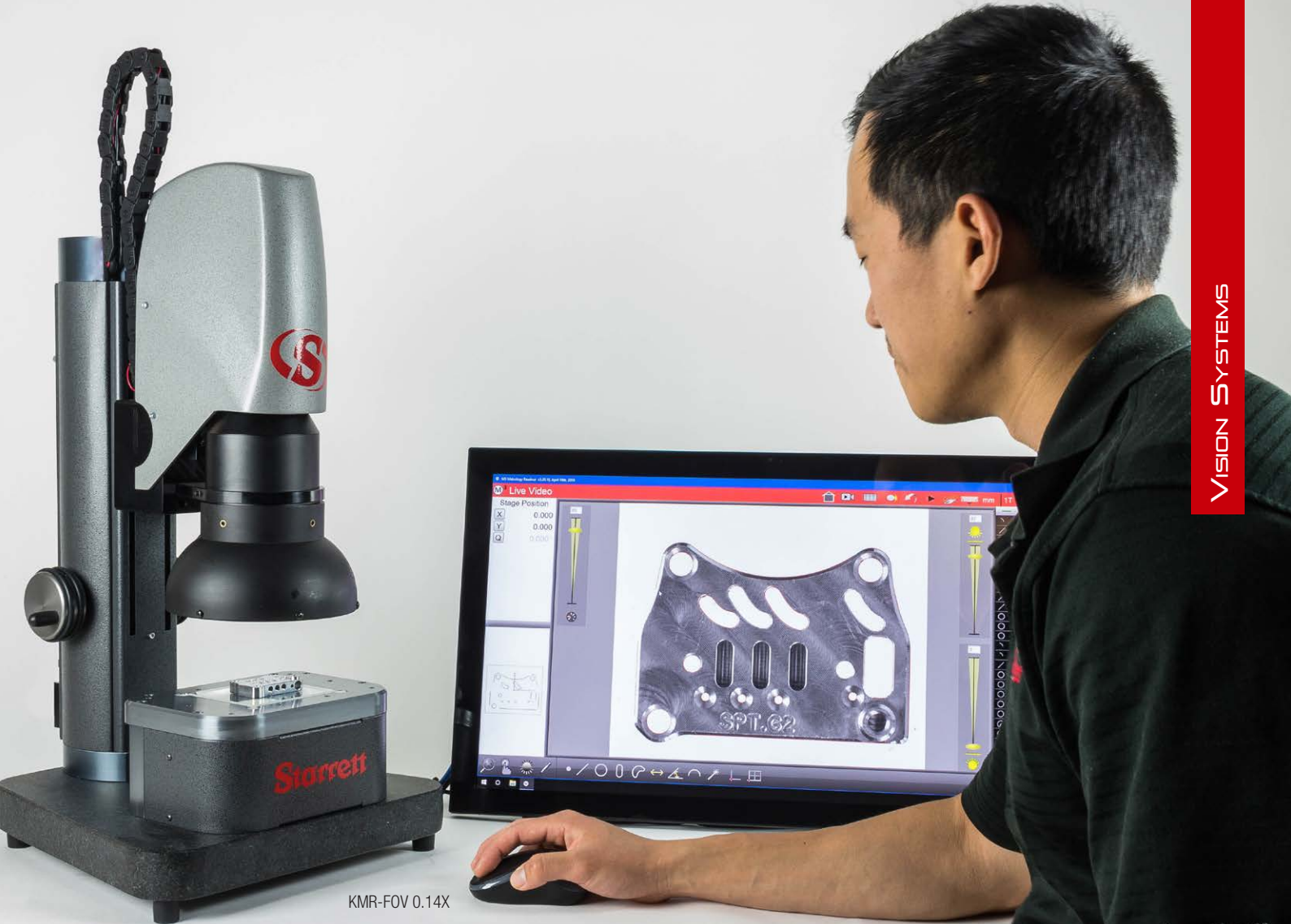
Call (949) 348-1213 for an exact quote.

KMR-M3



Click the QR code to view the KMR Series





KMR-FOV 0.14X

	KMR	KMR FOV-0.3x	KMR FOV-0.5x	KMR FOV-1.0x
Part Number	KMR-Zoom-M3	KMR-FOV-M3-0.3x	KMR-FOV-M3-0.5x	KMR-FOV-M3-1.0x
Optics	6.5:1 Zoom	Telecentric Lens	Telecentric Lens	Telecentric Lens
CCD Sensor	1.33 M Pixel	2.02 M Pixel	2.02 M Pixel	2.02 M Pixel
Camera Interface	USB Cable	USB Cable	USB Cable	USB Cable
Computer	PC	PC	PC	PC
Software	Metlogix™ M3	Metlogix™ M3	Metlogix™ M3	Metlogix™ M3
Video Screen	24" Touchscreen Monitor	24" Touchscreen Monitor	24" Touchscreen Monitor	24" Touchscreen Monitor
Screen Resolution	1920 x 1080	1920 x 1080	1920 x 1080	1920 x 1080
Lens Magnification	0.7x to 4.5x Zoom Lens	0.3x	0.5x	1.0x
Screen Magnification	31x to 200x	13x	22x	45x
Auxiliary lenses	0.5x, 2.0x	N/A	N/A	N/A
Field of view width	0.055" to 0.35" (1.4mm to 9.0mm)	0.93" (24 mm)	0.56" (14mm)	0.28" (7.1mm)
Field of view height	0.045" to 0.29" (1.1mm to 7.4mm)	0.76" (19mm)	0.46" (11mm)	0.23" (5.8mm)
X-Y Stage Motion	None	None	None	None
Metrology Means	M3 FOV Software	M3 FOV Software	M3 FOV Software	M3 FOV Software
Measurement Resolution	Up to 2µm*	Up to 2µm*	Up to 2µm*	Up to 2µm*
Meas. Accuracy	Up to ±2.5µm*	Up to ±2.5µm*	Up to ±2.5µm*	Up to ±2.5µm*
Basic Stand	Standard	Standard	Standard	Standard
Boom Stand	Optional	N/A	N/A	N/A
LED Back Light	Standard	Standard	Standard	Standard
LED Ring Light	Standard	Standard	Standard	Standard
Lighting Control	Via M3 Software	Via M3 Software	Via M3 Software	Via M3 Software
Video Inspection	Yes	Yes	Yes	Yes
Basic Dimensions	Yes, VED- FOV Stage Measurement	Yes, VED- FOV Stage Measurement	Yes, VED- FOV Stage Measurement	Yes, VED- FOV Stage Measurement
Geometric Constructs	Yes	Yes	Yes	Yes
Image Annotation	Yes	Yes	Yes	Yes
Image Archiving	Yes	Yes	Yes	Yes
Video Edge Detection	Yes	Yes	Yes	Yes

\*These are best values. Actual values will depend on the zoom lens setting or the selected telecentric lens.

Disclaimer: Due to continual product improvements, specifications may change without notice.





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## EXCEED YOUR CAPABILITIES.

The Starrett® FMS Series incorporates new performance-based capabilities and user-friendly features to help you perform critical force tests with greater accuracy and efficiency. It can perform all of your basic force measurement tests, as well as more complex multi-stage tests to international standards.



New Starrett Force Tester Line

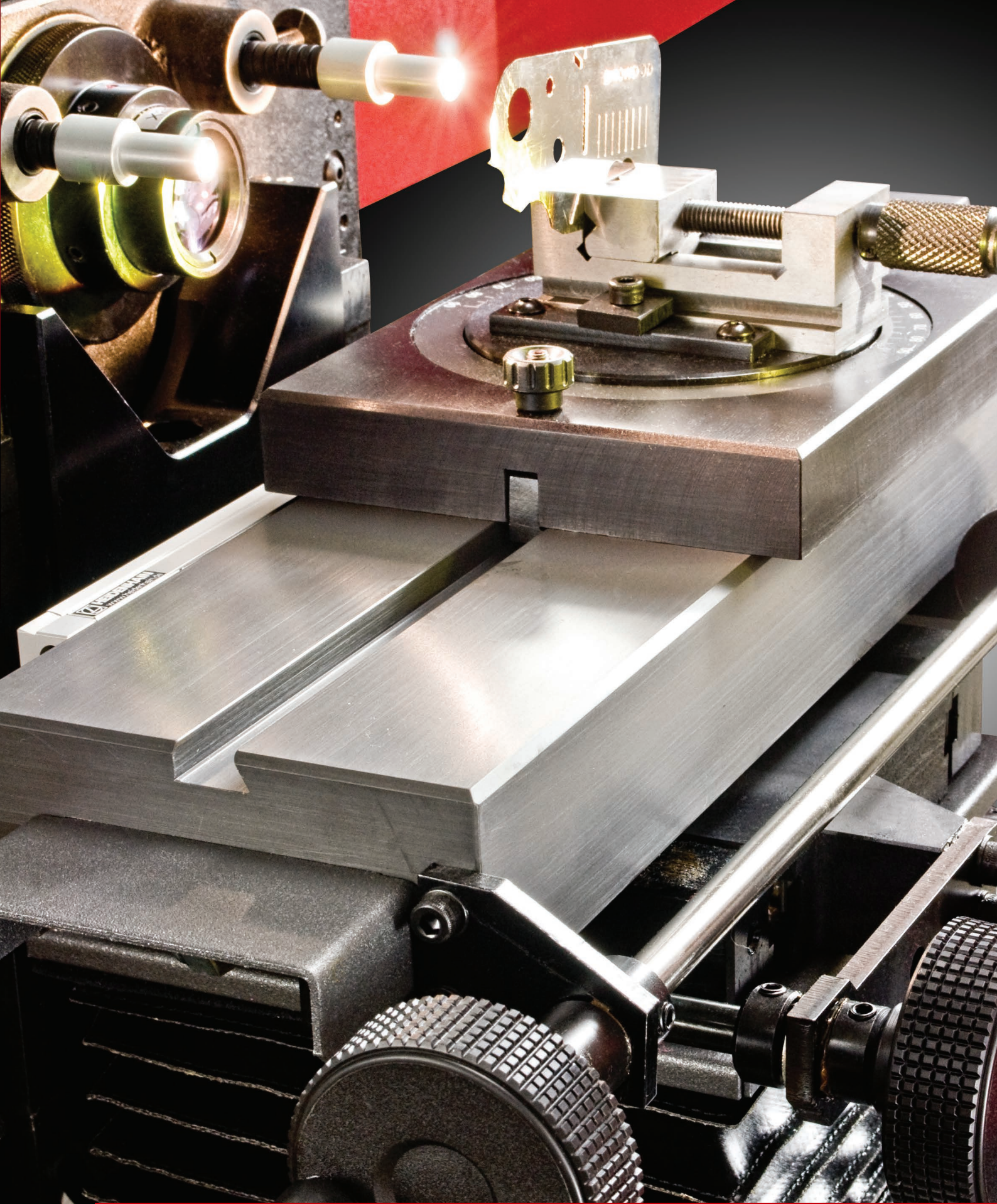
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## OPTICAL COMPARATORS



# HORIZONTAL BENCH-TOP OPTICAL COMPARATOR

## HE400

The most economical of our bench top comparators, the HE400 offers a 16" (400mm) diameter screen, 10" x 4" (250mm x 100mm) X-Y stage travel, LED lighting, choice of six bayonet-style fixed interchangeable lenses and Q-axis angular readout: all to improve capability and performance. These latest horizontal comparators are fitted with MetLogix™ M1, M2, or Mx-Series measuring software digital readout systems, making them simple to use, but having the power to satisfy the most complex measuring requirements.

### FEATURES AND SPECIFICATIONS

- All metal construction
- Single bayonet-style lens mounting system
- Collimating condenser with yellow/green filter and provision to mount further accessories
- Linear encoder (glass scale) with 1µm on both X and Y axes
- LED profile and surface illumination
- Fully retractable flexible duplex fiber optic surface illumination
- Digital protractor for accurate angle measurement 1' resolution
- Available with MetLogix™ M1 tablet, M2 PC-based touch screen measuring software, Mx100 or Mx200 digital readout system
- 15.4lb (7kg) load capacity
- 18.75" x 4.74" (480mm x 120mm) precision workstage top plate with machined slot for easy fixturing
- 10" x 4" (254mm x 100mm) of XY stage travel
- 1-1/8" (8mm) focus travel
- Fine adjustment on all axes
- Quick release mechanism on the X-axis

### OPTIONS

- Six interchangeable fixed magnification lenses including 10x, 20x, 25x, 31.25x, 50x and 100x
- Automatic fiber optic edge detection
- Canopy and curtains- free standing design (see Pg. 51)
- Purpose built cabinet stand
- Extensive line of accessories



Click the QR code to view the HE400





#### Operator Interface

Feature	M1	M2	Mx100	Mx200
Optical edge detection (Option)	x	x	—	x
Geometric Functions	x	x	—	x
Graphic Based Constructions	—	x	—	x
Tolerancing	—	x	—	x
Data export reporting	x	x	x	x
Part programming and playback	—	x	—	x
Operating system	MLX Android™	MS Windows®	MLX Android™	MLX Android™
Part view display	—	x	—	—
Feature annotation	—	x	—	—
Software developer	MetLogix™	MetLogix™	MetLogix™	MetLogix™

#### Specifications

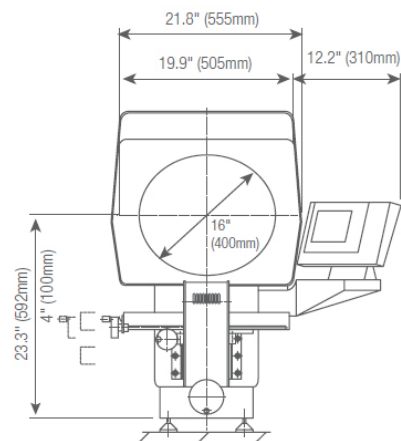
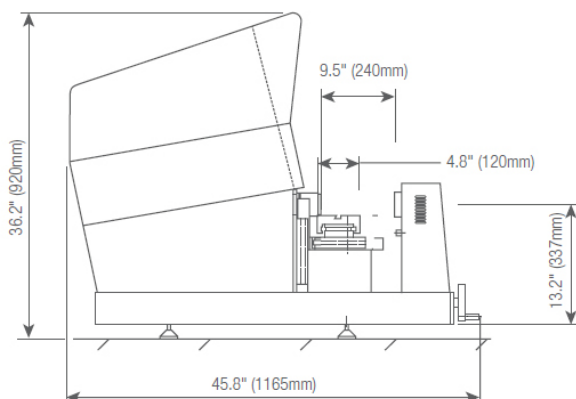
	HE400
Horizontal Travel	10" (250mm)
Vertical Travel	4" (100mm)
Focus Travel	1-1/8" (28mm)
Top Plate*	18.75" x 4.7" (480mm x 120mm)
Image	Inverted and reversed

\*With machined single slot for easy fixturing

#### Weight and Dimensions

	HE400
Net Weight	230lbs 105kg
Shipping Weight	320lbs 146kg
Shipping Dimensions	49" x 32" x 51" (125cm x 81cm x 130cm)

#### HE400 DIMENSIONS





# HORIZONTAL BENCH-TOP OPTICAL COMPARATOR- HB400

The HB400 Optical Comparator provides exceptional performance with a 16" (400mm) diameter viewing screen, LED lighting, and 110lbs (50kg) workstage load capacity. Available with optical and/or video edge detection which removes operator subjectivity in locating edges of parts being measured. A bayonet style lens mounting system accepts a choice of six fixed interchangeable lenses as well as the OV2 Zoom or TOV2 fixed telecentric magnification video camera systems. Motorized stage, fully automatic CNC controls and swing-away lamp house are all optional features. This comparator provides performance previously only available with floor standing models.

## FEATURES AND SPECIFICATIONS

- 16" x 6" X-Y travel workstage (400mm x 150mm)
- All metal construction with hard-anodized stage tooling plate
- Single bayonet-style lens mounting system
- Collimating condenser with yellow/green filter and provision to mount further accessories
- Linear encoder (glass scale) with 20µin (0.5µm) resolution on both X and Y axes
- LED profile and surface illumination
- Fixed duplex fiber optic surface illumination
- Digital protractor for accurate angle measurement (1' resolution) via Q-axis readout
- Available with MetLogix™ M1 tablet, M2 or M3 measuring software touch-screen and PC, or Mx-Series digital readout.
- Fine adjustment on all axes
- Quick release mechanism on the X-axis

## OPTIONS

- Six interchangeable fixed magnification lenses including 10x, 20x, 25x, 31.25x, 50x and 100x
- Optional 5x fixed or interchangeable lens system available by special order
- Automatic optical edge detection
- Automatic video edge detection (available only with OV2 or TOV2 video cameras and M3 software)
- OV2 Video Camera with 6.5:1 zoom lens
- TOV2 Telecentric Video Camera with choice of 0.3x or 0.5x fixed magnification lens
- Motorized X and Y axes
- Fully automatic CNC controls
- Swing-away lamp house
- Canopy and curtains- free standing design (see Pg. 51)
- Purpose built cabinet stand
- Extensive line of accessories



Click the QR code to  
view the HB400





Optional 5x Lens

**Operator Interface**

Feature	M1	M2	M3	Mx100	Mx200
Optical edge detection (Option)	x	x	x	—	x
Geometric Functions	x	x	x	—	x
Graphic Based Constructions	—	x	x	—	x
Tolerancing	—	x	x	—	x
Data export reporting	x	x	x	x	x
Part programming and playback	—	x	x	—	x
Operating system	MLX Android™	MS Windows®	Windows®	MLX Android™	MLX Android™
Part view display	—	x	x	—	—
Feature annotation	—	x	x	—	—
CNC drive option	—	—	x	—	—
Video edge detection (option)	—	—	x	—	—
CAD file import and export option	—	—	x	—	—
Software developer	MetLogix™	MetLogix™	MetLogix™	MetLogix™	MetLogix™

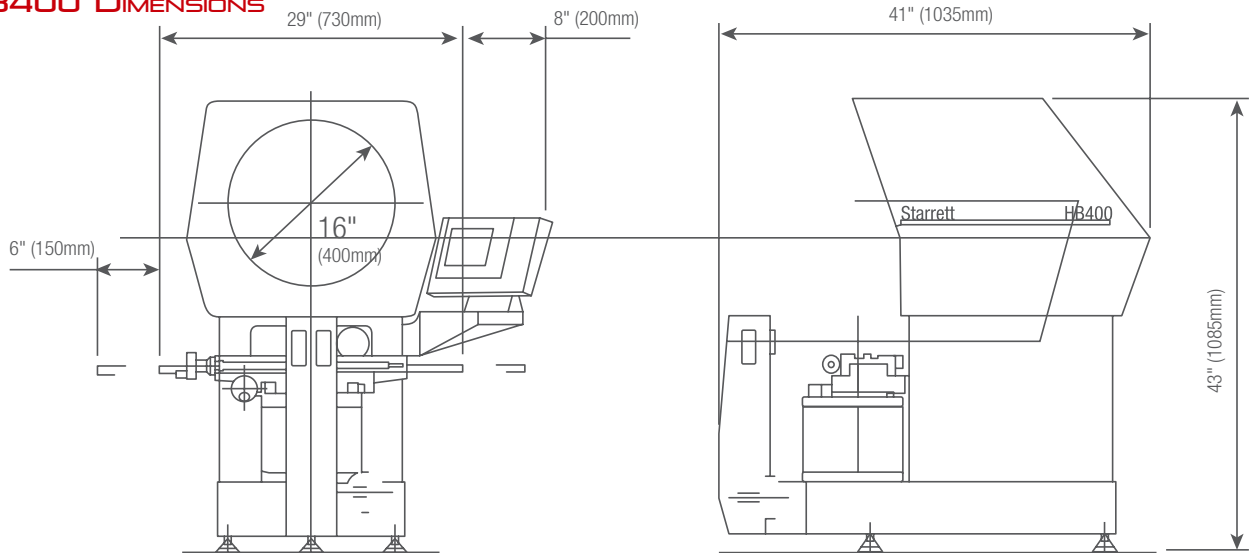
**Specifications**

	HB400
Horizontal Travel	16" (400mm)
Vertical Travel	6" (150mm)
Focus Travel	2" (50mm)
Top Plate*	21" x 5" (530mm x 120mm)
Image	Erect and reversed

\*With machined slots for easy fixturing

**Weight and Dimensions**

	HB400
Net Weight	320lbs 145kg
Shipping Weight	385lbs 175kg
Shipping Dimensions	49" x 32" x 51" (125cm x 81cm x 130cm)

**HB400 DIMENSIONS**

# HORIZONTAL BENCH-TOP OPTICAL COMPARATOR

## HD400

### DUAL LENS

The HD400 is a dual lens optical comparator offering a two-lens mount allowing instant switching between two magnifications lenses or video camera adapter. The HD400 is equipped with a 16" (400mm) travel workstage as standard. Optional automatic edge detection or video edge detection removes operator subjectivity in locating edges of parts being measured. A bayonet style lens mounting system accepts a choice of six interchangeable lenses as well as our OV2 Zoom or TOV2 fixed telecentric magnification video camera systems. Motorized stage, fully automatic CNC controls and swing-away lamp house are all optional features.

### FEATURES AND SPECIFICATIONS

- 16" x 6" (400mm x 150mm) X-Y travel workstage
- All metal construction with hard-anodized stage tooling plate
- 16" (400mm) diameter screen
- Dual-lens mounting system
- Collimating condenser with yellow/green filter and provision to mount further accessories
- Linear encoder (glass scale) with 20µin (0.5µm) resolution on both X and Y axes
- LED profile and surface illumination
- Fully retractable flexible duplex fiber optic surface illumination
- Digital protractor for accurate angle measurements (1' resolution) via Q-axis readout
- Helix adjustment for accurate thread form inspection
- Available with MetLogix™ M1 tablet, M2 or M3 PC-based touch screen measuring software or Mx-Series digital readout system
- Fine adjustment on all axes
- Quick release mechanism on the X-axis

### OPTIONS

- Six interchangeable fixed magnification lenses including 10x, 20x, 25x, 31.25x, 50x and 100x
- Automatic optical edge detection
- Automatic video edge detection (available only with OV2 or TOV2 video cameras and M3 software)
- OV2 Video Camera with 6.5:1 zoom lens
- TOV2 Telecentric Video Camera with choice of 0.3x, or 0.5x fixed magnification lens
- Motorized X and Y axes
- Fully automatic CNC controls
- Swing-away lamp house
- Canopy and curtains- free standing design (see Pg. 51)
- Purpose built cabinet stand
- Extensive line of accessories

OV Lens



Click the QR code to view the HD400







#### Operator Interface

Feature	M1	M2	M3	Mx100	Mx200
Optical edge detection (Option)	x	x	x	—	x
Geometric Functions	x	x	x	—	x
Graphic Based Constructions	—	x	x	—	x
Tolerancing	—	x	x	—	x
Data export reporting	x	x	x	x	x
Part programming and playback	—	x	x	—	x
Operating system	MLX Android™	MS Windows®	Windows®	MLX Android™	MLX Android™
Part view display	—	x	x	—	—
Feature annotation	—	x	x	—	—
CNC drive option	—	—	x	—	—
Video edge detection (option)	—	—	x	—	—
CAD file import and export option	—	—	x	—	—
Software developer	MetLogix™	MetLogix™	MetLogix™	MetLogix™	MetLogix™

#### Specifications

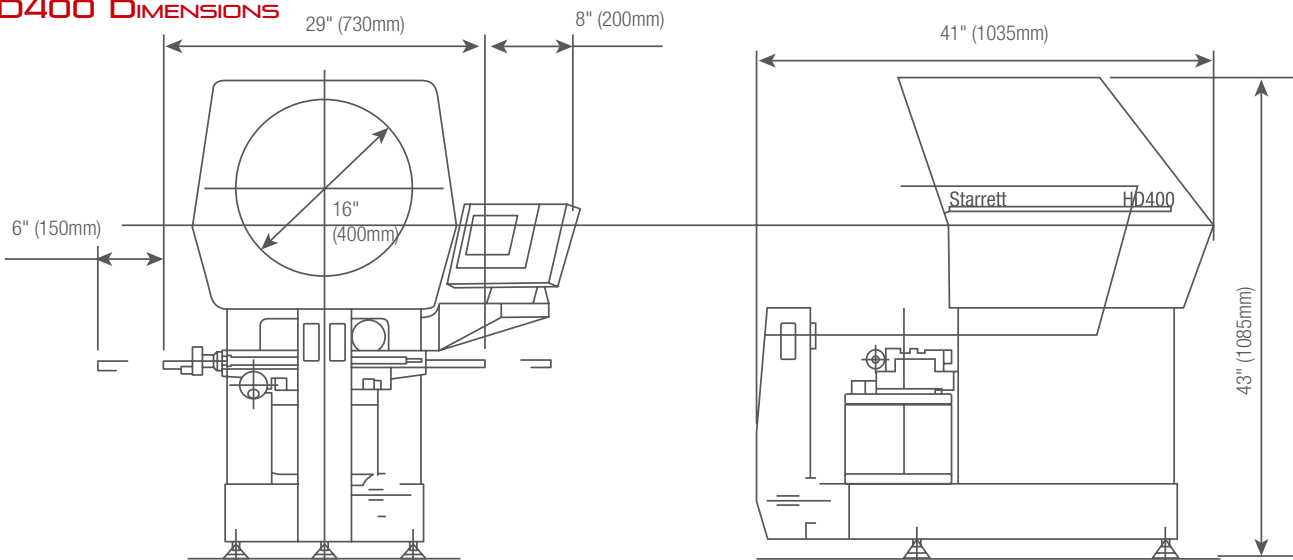
	HD400
Horizontal Travel	16" (400mm)
Vertical Travel	6" (150mm)
Focus Travel	2" (50mm)
Top Plate*	21" x 5" (530mm x 120mm)
Image	Erect and reversed

\*With machined slots for easy fixturing

#### Weight and Dimensions

	HD400
Net Weight	320lbs 145kg
Shipping Weight	385lbs 175kg
Shipping Dimensions	49" x 32" x 51" (125cm x 81cm 130cm)

#### HD400 DIMENSIONS



# HORIZONTAL FLOOR STANDING OPTICAL COMPARATOR

## HF600

Well known throughout the world for superior value and exceptional measuring performance across the full measuring range and at all magnifications, the HF600 sets the standard in all applications from the QC lab to the production floor. The HF600 comparator has a four-position lens turret for instant selection of optional magnification lenses. Inserting the optional OV2 or TOV2 Video Camera System converts the comparator into a video metrology system. Ideal for use over a broad spectrum of industries and applications, the HF600 is designed and built to satisfy the requirements of measuring small to large work pieces with total precision, ruggedness, and efficiency. The HF600 utilizes 2D measurement software for geometries like diameters, radius, angles, lines, points, and for skew correction. Advanced software can also provide many tools such as CAD file import, CAD data export for reverse engineering, standard and custom reports, and Ethernet networking.

### FEATURES AND SPECIFICATIONS

- 12" x 8" X-Y travel workstage (300 x 200mm)
- All metal construction with nickel plated stage tooling plate
- 24" (600mm) diameter screen with precision cross lines and overlay clips
- Motorized X and Y axes standard
- Two-axis power drive via joystick and variable speed control for fine adjustment
- Projection lens turret with four lens capacity (lenses not included)
- Turret mounted condenser system and yellow/green filter and provision to mount further accessories
- Stage Weight Capacity: 330lbs (150kg) (evenly distributed)
- Workstage capacity between centers: 17.5" (440mm)
- Fully retractable duplex fiber optic surface illumination
- 20µin (0.5µm) resolution Heidenhain linear scales
- Screen driven rotary Q-axis with 1' resolution
- Available with MetLogix™ M1 tablet, M2 or M3 measuring software with touch screen and PC, or Mx-Series digital readout systems
- Complete with full canopy and curtains

Small Centers and Vees



Click the QR code to  
view the HF600



### OPTIONS

- Six interchangeable lens magnification including 10x, 20x, 25x, 31.25x, 50x and 100x
- Optional 5x fixed or 5x interchangeable on a 3-lens turret available by special order
- Interchangeable OV2 video camera system with a 6.5:1 zoom lens
- Interchangeable TOV2 telecentric video camera systems with choice of 0.16x, 0.3x or 0.5x fixed magnification lenses
- Extended Stage Travel: 20" (500mm) X-axis; 8" (200mm) Y-axis
- Fully automatic CNC controls
- Automatic Optical Edge Detection
- Automatic Video Edge Detection available only with OV2 and TOV2 video camera systems
- Swing-away lamp house
- Extensive line of accessories



HF600





#### Operator Interface

	M1	M2	M3	Mx100	Mx200
Optical edge detection (Option)	x	x	x	—	x
Geometric Functions	x	x	x	—	x
Graphic Based Constructions	—	x	x	—	x
Tolerancing	—	x	x	—	x
Data export reporting	x	x	x	x	x
Part programming and playback	—	x	x	—	x
Operating system	MLX Android™	MS Windows®	Windows®	MLX Android™	MLX Android™
Part view display	—	x	x	—	—
Feature annotation	—	x	x	—	—
CNC drive option	—	—	x	—	—
Video edge detection (option)	—	—	x	—	—
CAD file import and export option	—	—	x	—	—
Software developer	MetLogix™	MetLogix™	MetLogix™	MetLogix™	MetLogix™

#### Specifications

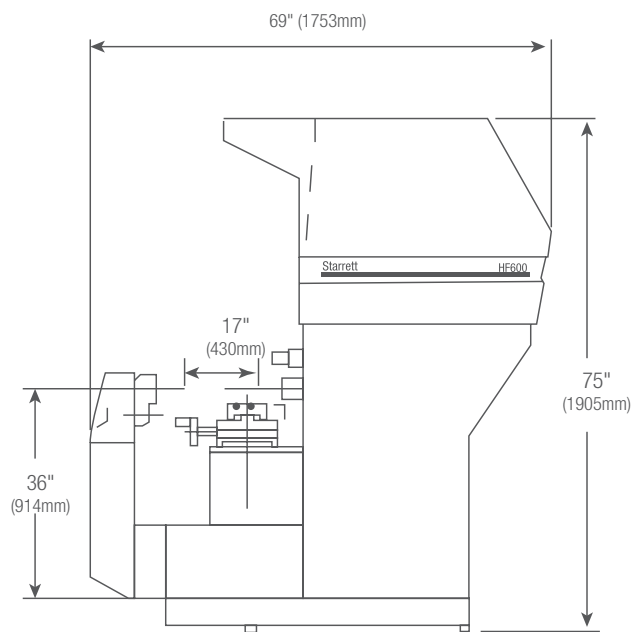
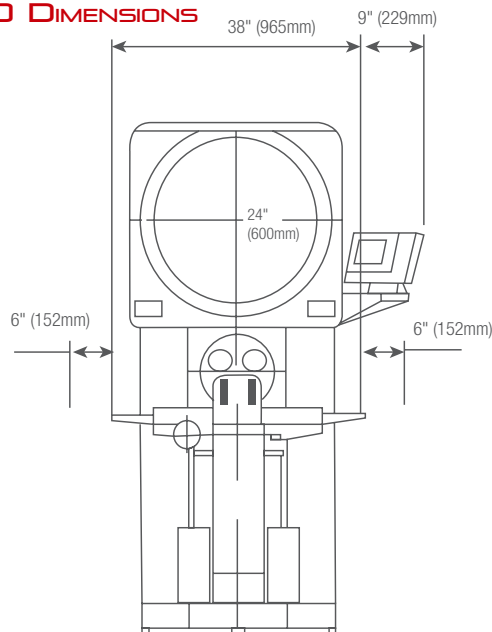
	HF600
Horizontal Travel	12" (300mm)
Vertical Travel	8" (200mm)
Focus Travel	3" (75mm)
Top Plate*	25 x 9" (635 x 230mm)
Image	Erect and reversed

\*With machined slots for easy fixturing

#### Weight and Dimensions

	HF600
Net Weight	1340lbs 610kg
Shipping Weight	1500lbs 680kg
Crated Dimensions	81 x 49 x 89" 206 x 125 x 226cm

#### HF600 DIMENSIONS



# HORIZONTAL FLOOR STANDING OPTICAL COMPARATOR

## HF750

Utilizing the same exemplary build standards as the HF600, the HF750 super capacity optical comparator delivers benefits from an even larger 30" (762mm) screen, setting a new standard for clarity and brightness. Ideal for use over a broad spectrum of industries and applications, the HF750 is designed and built to satisfy the requirements of measuring small to large work pieces with total precision, ruggedness, and efficiency. The geometric software measures diameter, radius, angle, line and point features, plus part skewing for faster setup. The HF750 is available with optical edge detection or video edge detection with advanced software and OV2 or TOV2 video camera options.

### FEATURES AND SPECIFICATIONS

- 12" x 8" X-Y travel workstage (300 x 200mm)
- All metal construction with nickel plated stage tooling plate
- 30" (762mm) diameter screen with precision cross lines and overlay clips
- Motorized X and Y axes standard
- Two-axis power drive via joystick and variable speed control for fine adjust
- Projection lens turret with three lens capacity (lenses not included)
- Turret mounted condenser system and yellow/green filter and provision to mount further accessories
- Stage Weight Capacity: 330lbs (150kg) (evenly distributed)
- Workstage capacity between centers 17.5" (440mm)
- Fully retractable duplex fiber optic surface illumination
- Halogen profile and surface illumination
- 20µin (0.5µm) resolution Heidenhain linear scales
- Screen driven rotary Q-axis with 1' resolution
- Available with MetLogix™ tablet, M2 measuring software with touch screen and PC, or Mx-Series digital readout systems
- Complete with full canopy and curtains

### OPTIONS

- Six interchangeable lens magnifications including 10x, 20x, 25x, 31.25x, 50x and 100x
- Optional 5x fixed or 5x interchangeable on a 3-lens turret available by special order
- Interchangeable OV2 video camera system with 6.5:1 zoom lens
- Interchangeable TOV2 telecentric video camera systems with choice of 0.16x, 0.3x or 0.5x fixed magnification lenses
- Extended Stage Travel: 20" (500mm) X-axis; 8" (200mm) Y-axis
- Fully automatic CNC controls
- Automatic optical edge detection
- Automatic video edge detection available only with OV2 and TOV2 video camera systems
- Swing-away lamp house
- Extensive line of accessories

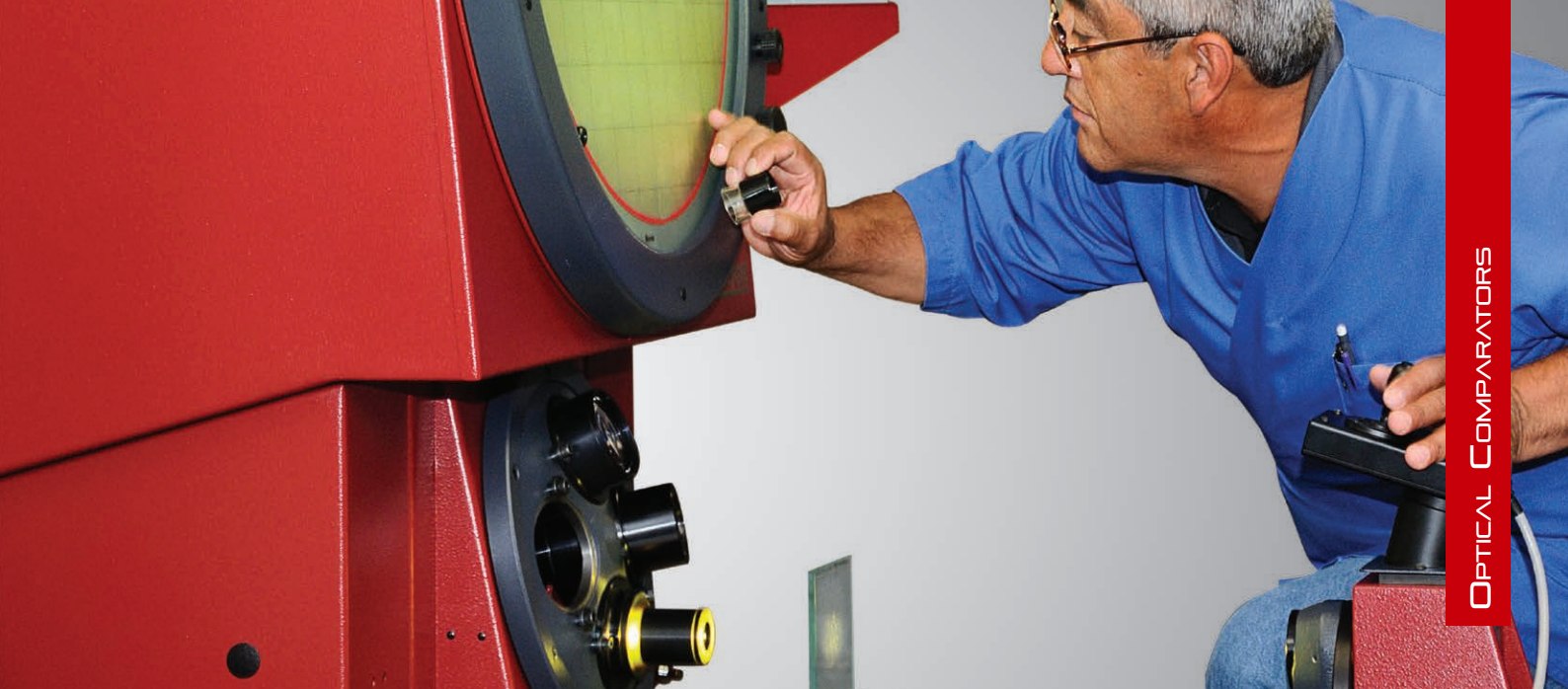
Universal Vee Block on Rotary Base



Click the QR code to  
view the HF750







### Operator Interface

Feature	M1	M2	M3	Mx100	Mx200
Optical edge detection (Option)	X	X	X	—	X
Geometric Functions	X	X	X	—	X
Graphic Based Constructions	—	X	X	—	X
Tolerancing	—	X	X	—	X
Data export reporting	X	X	X	X	X
Part programming and playback	—	X	X	—	X
Operating system	MLX Android™	MS Windows®	Windows®	MLX Android™	MLX Android™
Part view display	—	X	X	—	—
Feature annotation	—	X	X	—	—
CNC drive option	—	—	X	—	—
Video edge detection (option)	—	—	X	—	—
CAD file import and export option	—	—	X	—	—
Software developer	MetLogix™	MetLogix™	MetLogix™	MetLogix™	MetLogix™

### Specifications

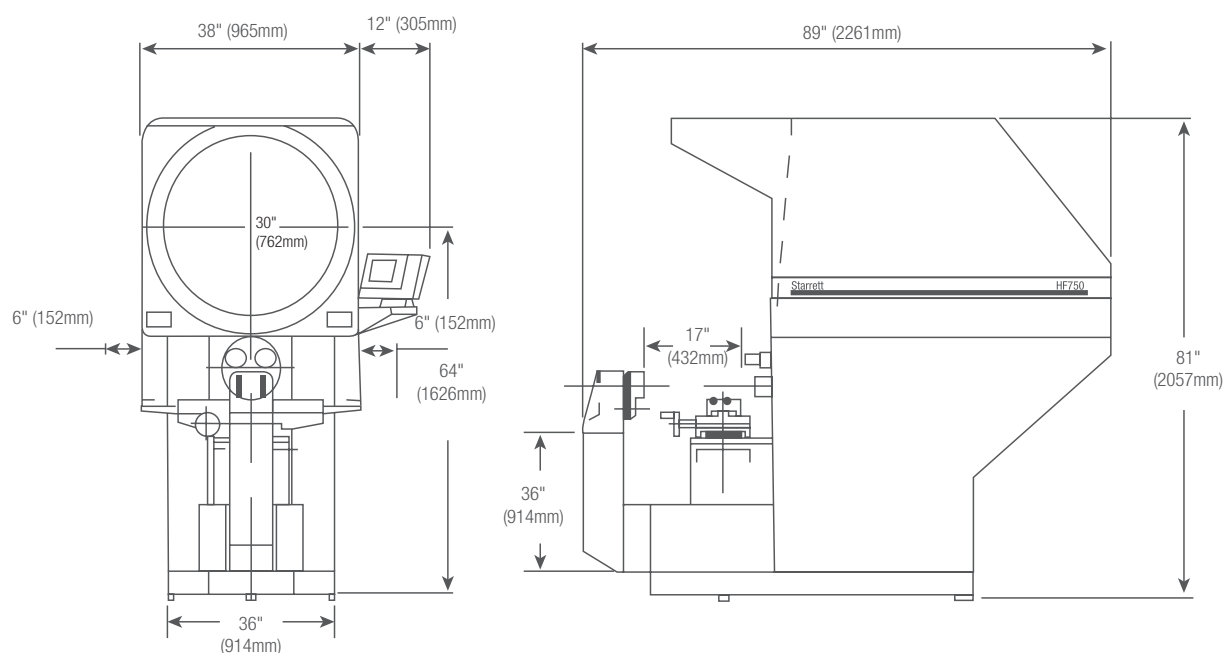
	HF750
Horizontal Travel	12" (300mm)
Vertical Travel	8" (200mm)
Focus Travel	3" (75mm)
Top Plate*	25 x 9" (635 x 230mm)
Image	Erect and reversed

\*With machined slots for easy fixturing

### Weight and Dimensions

	HF750
Net Weight	1660lbs 753kg
Shipping Weight	1800lbs 817kg
Crated Dimensions	96" x 48" x 91" 244cm x 124cm x 231cm

### HF750 DIMENSIONS



# VERTICAL BENCH-TOP OPTICAL COMPARATORS

## VB300

The VB300 is another optical comparator with the Starrett trademark formula: high performance at a low cost. This vertical bench top comparator is designed to meet the demands of modern industry and is ideal for the rapid inspection of small light-weight components, stampings, plastic molding, electronic components, small turned parts and more. The VB300 features a variety of digital displays making the VB300 easy to use and has the power to satisfy the most complex of measuring requirements.

### FEATURES AND SPECIFICATIONS

- All metal construction for optimum performance
- 12" (300mm) diameter screen with overlay clips
- Linear encoder (glass scale) with 4µin (0.1µm) resolution on both X and Y axes
- Stage weight capacity: 11lbs (5kg) (evenly distributed)
- LED profile and surface illumination
- Screen driven Q-axis
- Quick release mechanism on X-axis and Y-axis
- Available with a simple integrated LED readout display or choice of the new MetLogix™ M1 tablet, M2 PC-based measuring software, or Mx-Series digital readout systems

### OPTIONS

- Choice of four fixed magnification lenses including 10x, 20x, 25x and 50x
- Canopy and curtains- free standing design (see Pg. 51)
- Purpose built cabinet stand
- Work holding accessories

## VB400

The VB400 Vertical Optical Comparator allows flat parts to be simply laid on a glass insert in the workstage. Features include a 16" (400mm) diameter vertical screen, ultra-bright LED profile and surface illumination, and linear encoder scales for 4µin (0.1µm) resolution.

### FEATURES AND SPECIFICATIONS

- All metal construction
- 16" (400mm) diameter screen
- Collimating condenser with yellow/green filter and provision to mount further accessories
- Linear encoder (glass scale) with 4µin (0.1µm) resolution on both X and Y axes
- LED profile and surface illumination
- Digital protractor for accurate angle measurements (1' resolution) via Q-axis readout
- Available with MetLogix™ M1 tablet, M2 PC-based touch screen measuring software or Mx-Series digital readout system
- Fine adjustment on all axes
- Quick release mechanism on the X-Y axes

### OPTIONS

- Choice of five fixed magnification lenses including 10x, 20x, 25x, 31.25X and 50x
- Canopy and curtains- free standing design (see Pg. 51)
- Purpose built cabinet stand
- Work holding accessories

Click the QR code to view the VB Series



VB300



VB400



**Operator Interface- VB300**

Feature	Integral LED readout	MetLogix™ M1	M2	Mx100	Mx200
Angular digital measurement in readout	x	—	—	—	x
Mounted to comparator arm	—	x	x	x	x
Color graphics	—	x	x	x	x
Touch screen operation	—	x	x	x	x
Operating system	—	MLX Android™	Windows®	MLX Android™	MLX Android™
X-Y-Q axis digital readout	x	x	x	x	x
2D geometry software with skew	—	x	x	—	x
Optical edge detection option	—	x	x	—	x
Software developer	—	MetLogix™	MetLogix™	MetLogix™	MetLogix™

**Operator Interface- VB400**

Feature	MetLogix™ M1	M2	Mx100	Mx200
Mounted to comparator arm	x	x	x	x
Color graphics	x	x	x	x
Touch screen operation	x	x	x	x
Operating system	MLX Android™	Windows®	MLX Android™	MLX Android™
X-Y-Q axis digital readout	x	x	x	x
2D geometry software with skew	x	x	—	x
Optical edge detection option	x	x	—	x
Software developer	MetLogix™	MetLogix™	MetLogix™	MetLogix™

**Specifications**

	VB300
Horizontal Travel	4" (100mm)
Vertical Travel	4" (100mm)
Focus Travel	3.5" (90mm)
Top Plate*	9" x 9" (225mm x 225mm)
Glass Insert	6" x 6" (150mm x 150mm)
Image	Reversed

\*With machined slot for easy fixturing

**Weight and Dimensions**

	VB300
Net Weight	423lbs 192kg
Shipping Weight	443lbs 201kg
Gross Dimensions (L x W x H)	44" x 33" x 52" (112cm x 84cm x 132cm)

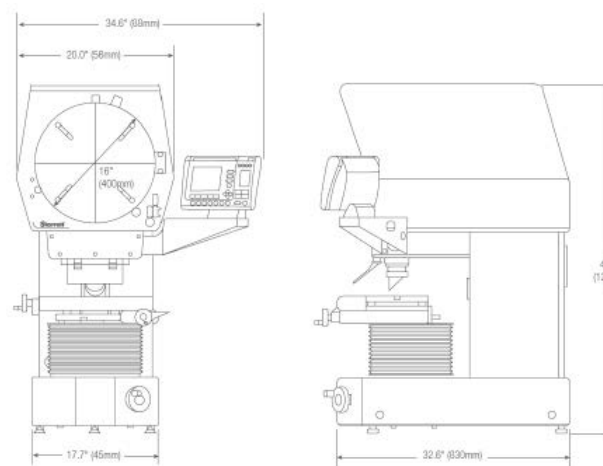
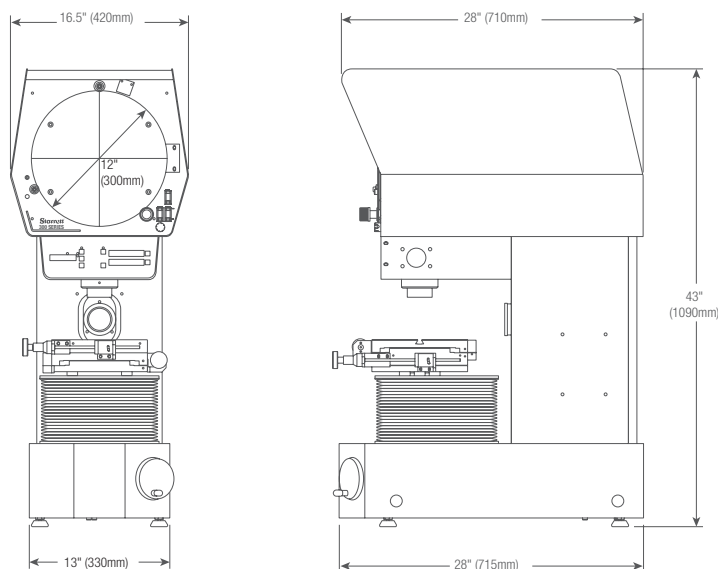
**Specifications**

	VB400
Horizontal Travel	8" (200mm)
Vertical Travel	4" (100mm)
Focus Travel	4" (100mm)
Top Plate*	16" x 9" (400mm x 230mm)
Glass Insert	9-1/4" x 5-1/2" (235mm x 140mm)
Image	Reversed

\*With machined slot for easy fixturing

**Weight and Dimensions**

	VB400
Net Weight	423lbs 192kg
Shipping Weight	443lbs 201kg
Shipping Dimensions (L x W x H)	49" x 32" x 51" (125cm x 81cm x 130cm)

**VB400 DIMENSIONS****VB300 DIMENSIONS**

# VERTICAL FLOOR STANDING OPTICAL COMPARATOR

## VF600

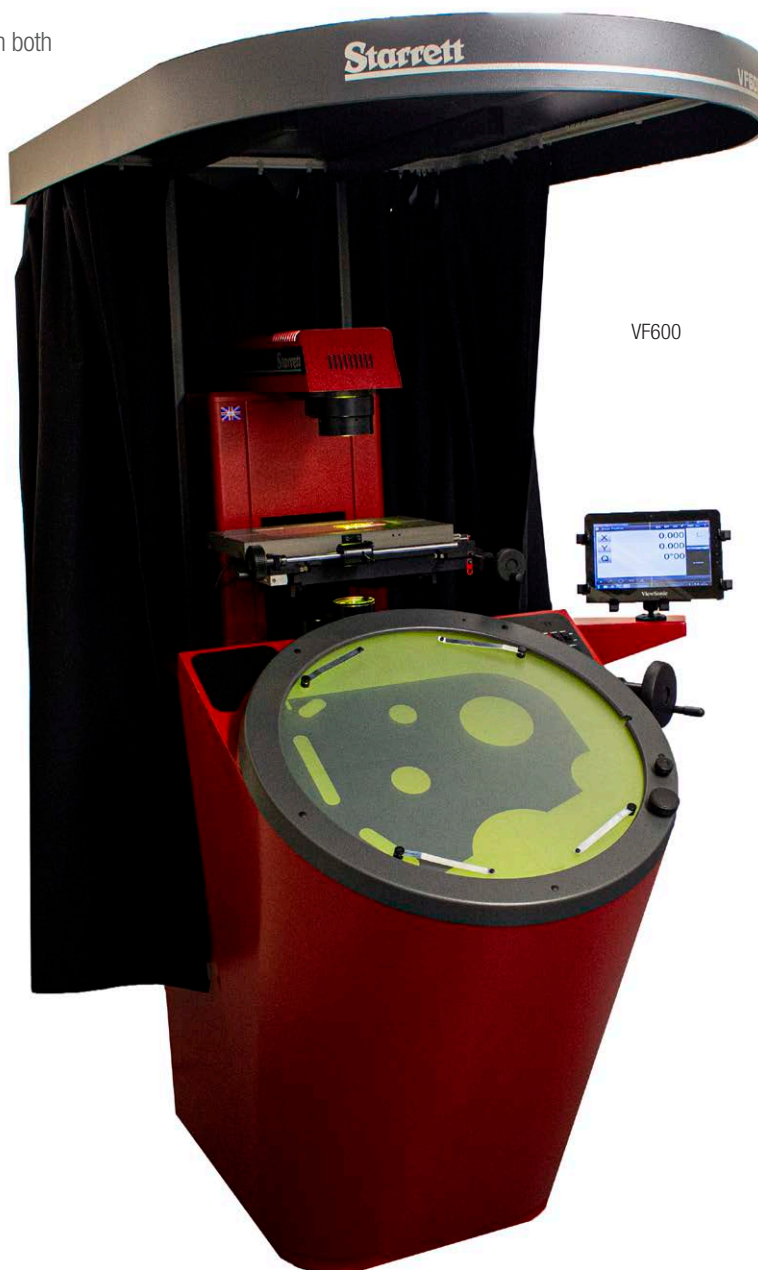
If your measuring requirements demand the use of a large screen vertical axis comparator, then look no further than the VF600. Ideal for the larger components found in the electronics, stamping, and extrusion industries, the VF600 is the ultimate in vertical axis optical comparators; a design based on years of knowledge in the manufacture of high performing optical comparators.

### FEATURES AND SPECIFICATIONS

- 8" x 4" X-Y travel workstage (200 x 100mm)
- Available with MetLogix™ M1 tablet, M2 measuring software with touch-screen with PC, or Mx-Series digital readout system
- Screen is angled 30° from horizontal for clear, easy viewing
- Projection lens turret with three lens capacity (lenses not included)
- Turret mounted condenser system complete with two lenses and yellow/green filter with provision to mount further accessories
- Full canopy and curtains
- Linear encoder (glass scale) with 0.5µm resolution on both X and Y axes

### OPTIONS

- Choice of five fixed magnification lenses including 10x, 20x, 25x, 50x and 100x
- 5x fixed lens by special order
- Automatic edge detection
- Motorized X-Y axis
- Fully automatic CNC controls



VF600

Click the QR code to  
view the VF600







### Operator Interface

Feature	M1	M2	M3	Mx100	Mx200
Optical edge detection (Option)	x	x	x	—	x
Geometric Functions	x	x	x	—	x
Graphic Based Constructions	—	x	x	—	x
Tolerancing	—	x	x	—	x
Data export reporting	x	x	x	x	x
Part programming and playback	—	x	x	—	x
Operating system	MLX Android™	MS Windows®	Windows®	MLX Android™	MLX Android™
Part view display	—	x	x	—	—
Feature annotation	—	x	x	—	—
CNC drive option	—	—	x	—	—
Video edge detection (option)	—	—	x	—	—
CAD file import and export option	—	—	x	—	—
Software developer	MetLogix™	MetLogix™	MetLogix™	MetLogix™	MetLogix™

### Specifications

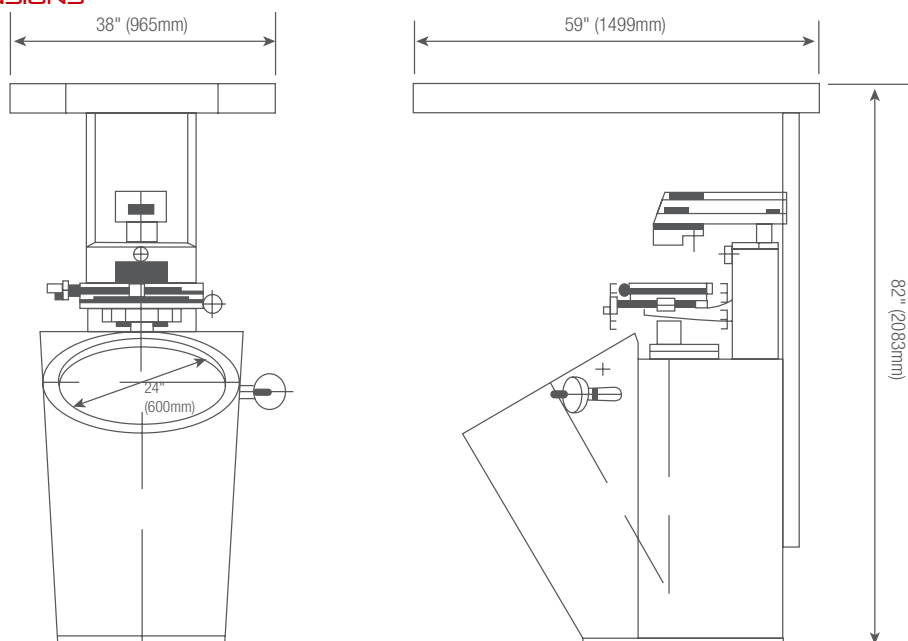
	VF600
Horizontal Travel	8" (200mm)
Vertical Travel	4" (100mm)
Focus Travel	4" (100mm)
Top Plate*	16 x 9" (400 x 230mm)
Glass Insert	9-1/4 x 5-1/2" (235 x 140mm)
Image	Inverted and reversed

\*With machined slots for easy fixturing

### Weight and Dimensions

	VF600
Net Weight	507lbs 230kg
Shipping Weight	937lbs 425kg
Shipping Dimensions	60 x 47 x 81" 152 x 120 x 206cm

### VF600 DIMENSIONS





# OV2™ OPTICAL COMPARATOR VIDEO ADAPTER

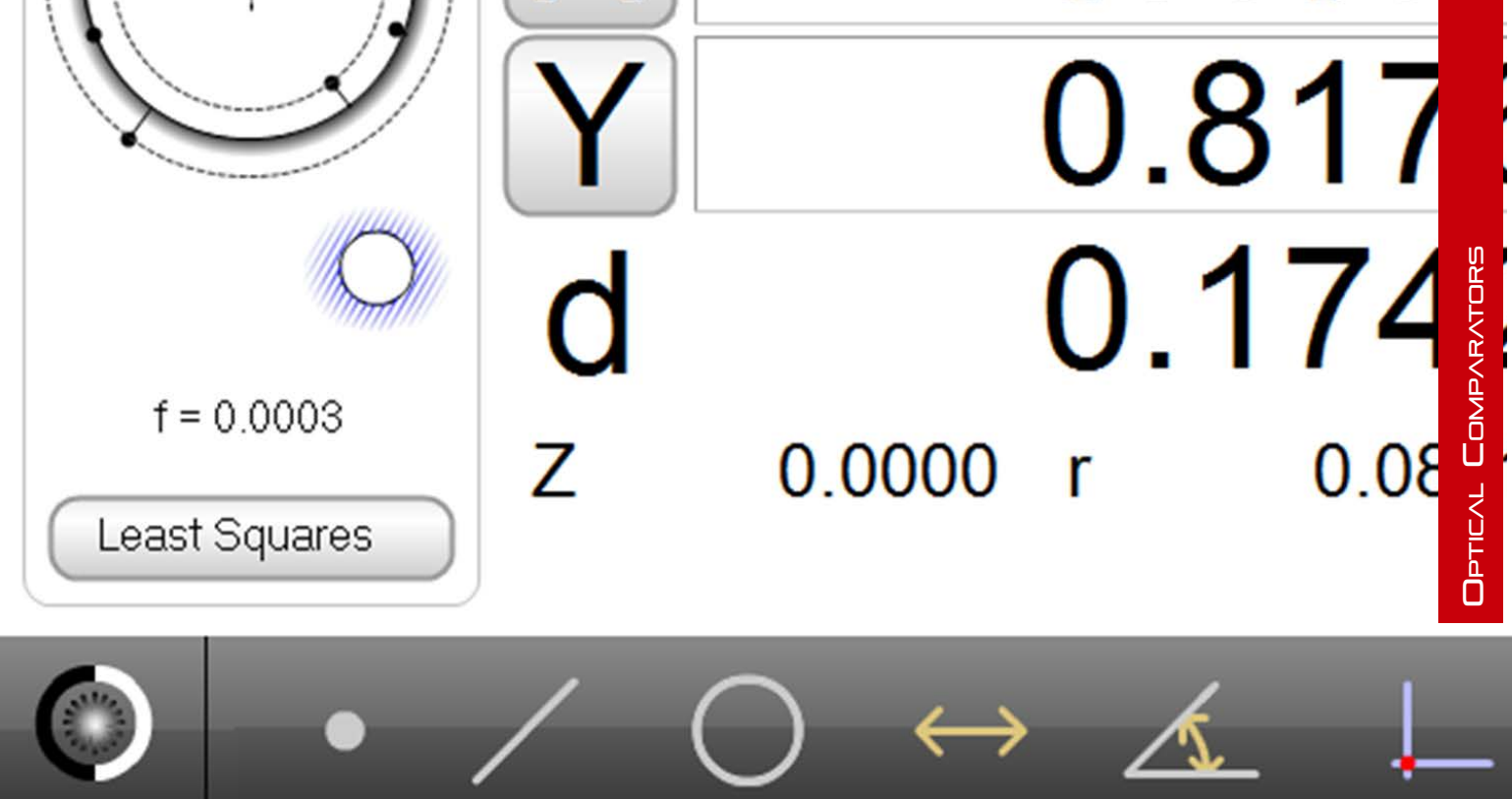
The OV2 is a special zoom lens and video camera adapter that can be interchanged with the fixed magnification lens on Starrett Optical Comparators. Combined with MetLogix™ M3 measuring software and touch-screen with PC, the result is a low cost video measuring system, expanding the versatility of your optical comparator! The OV2 is available as an option with new Starrett comparators and as an easy-to-install field retrofit. When used with the dual-lens HD400, and the HF600 and HF750 multi-lens turrets, the OV2 allows immediate access to both Video and Optical measurement without changing the part setup.

## FEATURES AND SPECIFICATIONS

- Interchangeable bayonet style lens mount with 6.5:1 zoom lens, surface ring light and video camera creates a video measuring system
- Changeover between normal optical mode and OV2 is easy and fast
- Lens locks into comparator body and is pre-aligned
- Up to 1.25" (32mm) of working distance allows maximum stage travel utilization
- Video magnifications up to 240x
- Utilizes MetLogix™ M3 measuring software and touch-screen with PC for video display
- Maximizes existing investment to provide a low cost entry into video measurement technology
- Available for other makes of optical comparators, please call for more information







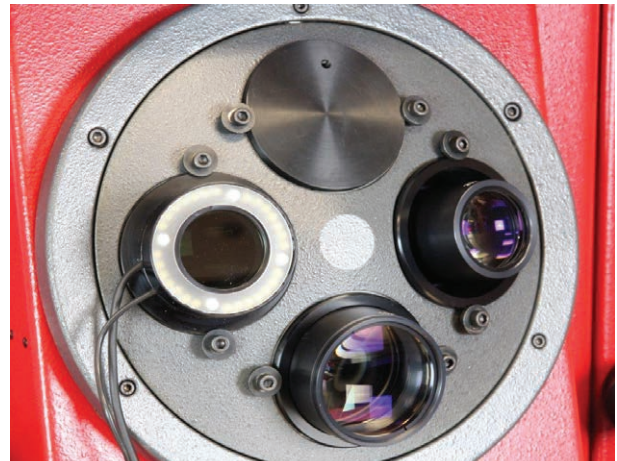
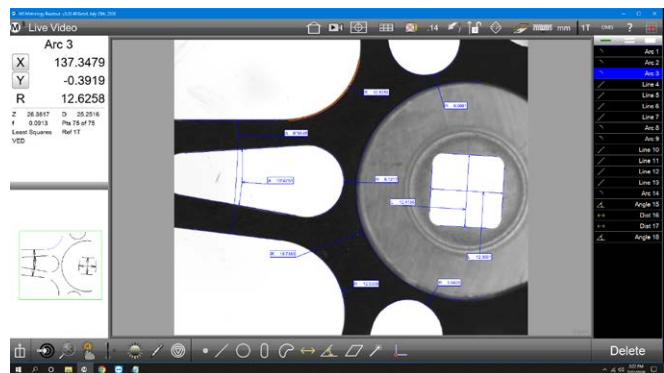
## TOV2 OPTICAL COMPARATOR TELECENTRIC VIDEO ADAPTER

The TOV2 telecentric lens and video camera can be interchanged with the fixed magnification lenses on Starrett Optical Comparators that utilize MetLogix™ M3 software. The TOV2 is available with a choice of 0.16x, 0.3x or 0.5x telecentric lenses as an option with new Starrett comparators and an easy-to-install field retrofit.

### FEATURES AND SPECIFICATIONS

- Interchangeable bayonet-style lens mount with choice of 3 telecentric lenses, a surface ring light and video camera to create a video measuring system
- Offers a choice of 0.16x, 0.3x, 0.5x or 1.0x telecentric magnification lenses (compatibility depends on model)
- Changeover between normal optical mode and TOV2 is easy and fast
- Lens locks into comparator body and is pre-aligned
- Utilizes MetLogix™ M3 video based measuring software and a touch-screen with PC for video display
- Maximizes existing investment to provide a low cost entry into video measurement technology
- Available for other makes of optical comparators, please call for more information

M3 software display



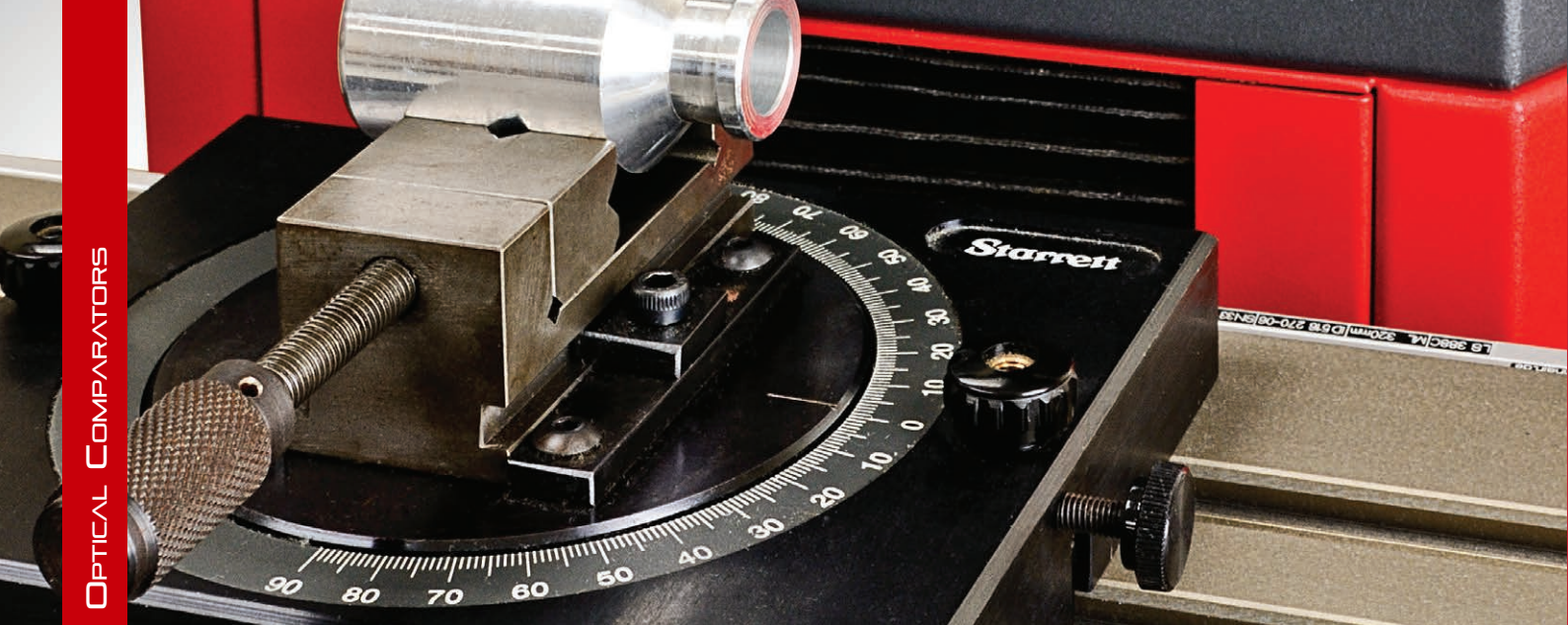
# SPECIFICATIONS AND OPTIONS

Model	HE400	HB400	HD400	VB300	VB400
Bench Top System	x	x	x	x	x
Floor-Standing System	—	—	—	—	—
Part View Orientation	Horizontal	Horizontal	Horizontal	Vertical	Vertical
Side Bed Version	—	—	—	—	—
Screen Diameter (in)	16"	16"	16"	12"	16"
Screen Diameter (mm)	400mm	400mm	400mm	300mm	400mm
X-Y Measuring Range (in)	10" x 4"	16" x 6"	16" x 6"	4" x 4"	8" x 4"
X-Y Measuring Range (mm)	254mm x 100mm	400mm x 150mm	400mm x 150mm	100mm x 100mm	200mm x 100mm
Linear Glass Scale Encoder on X and Y Axis	Standard	Standard	Standard	Standard	Standard
Motorized X-Y Axis	—	Optional	Optional	—	—
CNC Control	—	Optional	Optional	—	—
Focus Range (in)	1.2"	2"	2"	3.5"	4"
Focus Range (mm)	30mm	50mm	50mm	90mm	100mm
Work Stage (in)	18.75" x 4.75"	21" x 5"	21" x 5"	9" x 9"	16" x 9"
Work Stage (mm)	480mm x 120mm	530mm x 130mm	530mm x 130mm	225mm x 225mm	400mm x 225mm
Load Capacity with Negligible Deflection (lbs)	15lbs (6.8kg)	22lbs (10kg)	22lbs (10kg)	11lbs (5kg)	22lbs (10kg)
Load Capacity Maximum (lbs)	55lbs (25kg)	110lbs (50kg)	110lbs (50kg)	15lbs (6.8kg)	50lbs (22.7kg)
Angular Measurement Resolution	1'	1'	1'	1'	1'
Profile Illumination	Standard	Standard	Standard	Standard	Standard
Surface Illumination	Standard	Standard	Standard	Standard	Standard
Quick Change Lens Mount (lenses not included)	Single	Single	Dual	Single	Single
Collimating Condenser with Yellow/Green Filter	Standard	Standard	Standard	Standard	Standard
Control System Software	M1, M2, Mx100, Mx200	M1, M2, M3, Mx100, Mx200	M1, M2, M3, Mx100, Mx200	LED Display, M1, M2, Mx100, Mx200	M1, M2, Mx100, Mx200
Display (control system dependent)	M1 tablet, 15" All-in-One touch screen PC, Mx DRO	M1 tablet, 15" All-in-One touch screen PC, 24" touch screen monitor with PC, Mx DRO	M1 tablet, 15" All-in-One touch screen PC, 24" touch screen monitor with PC, Mx DRO	LED Display, M1 tablet, 15" All-in-One touch screen PC, Mx DRO	M1 tablet, 15" All-in-One touch screen PC, Mx DRO
Optical Edge Detection	Optional	Optional	Optional	Optional	Optional
Digital Video Camera System	—	Optional	Optional	—	—
Lenses - Screen Magnification (one required, not included)	10x, 20x, 25x, 31.25x, 50x, 100x	10x, 20x, 25x, 31.25x, 50x, 100x	10x, 20x, 25x, 31.25x, 50x, 100x	10x, 20x, 25x, 50x	10x, 20x, 25x, 50x, 100x
Iris Diaphragm	Optional	Optional	Optional	—	—
Precision Rotary Vise	Optional	Optional	Optional	—	—
Vee Block on Rotary Base	Optional	Optional	Optional	—	—
Precision Fixed Vise	Optional	Optional	Optional	—	—
Precision Centers and Vees	Optional	Optional	Optional	Optional	Optional
Helix Center Support System	—	—	—	—	Optional
Precision Rotary Work Stage	—	—	—	—	Optional
Glass Plate Work Holder	Optional	Optional	Optional	—	—
Field of View Diameter (in)	0.15", 0.3", 0.5", 0.6", 0.8", 1.6"	0.15", 0.3", 0.5", 0.6", 0.8", 1.6"	0.15", 0.3", 0.5", 0.6", 0.8", 1.6"	0.15", 0.3", 0.5", 0.8"	0.15", 0.3", 0.5", 0.8", 1.6"
Field of View Diameter (mm)	4mm, 8mm, 13mm, 16mm, 20mm, 40mm	4mm, 8mm, 13mm, 16mm, 20mm, 40mm	4mm, 8mm, 13mm, 16mm, 20mm, 40mm	4mm, 8mm, 13mm, 20mm	4mm, 8mm, 13mm, 16mm, 20mm
Working Distance (in)	1.5", 2", 2.2", 2.5", 3", 3.1"	1.5", 2", 2.2", 2.5", 3", 3.1"	1.5", 2", 2.2", 2.5", 3", 3.1"	1.5" 2", 2.2", 3"	1.5" 2", 2.2", 3", 3.1"
Working Distance (mm)	41mm, 50mm, 57mm, 62mm, 76mm, 80mm	41mm, 50mm, 57mm, 62mm, 76mm, 80mm	41mm, 50mm, 57mm, 62mm, 76mm, 80mm	41mm, 50mm, 57mm, 76mm	41mm, 50mm, 57mm, 62mm, 76mm
Cabinet Stand 31"	Optional	Optional	Optional	Optional	Optional
Cabinet Stand 22"	Optional	Optional	Optional	Optional	Optional
Canopy and Curtains	Optional	Optional	Optional	Optional	Optional



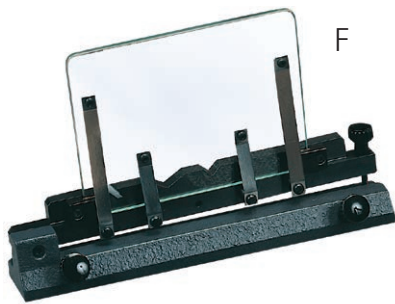
	VF600	HF600	HF750	HS600*	HS750*
	—	—	—	—	—
	x	x	x	x	x
	Vertical	Horizontal	Horizontal	Horizontal	Horizontal
	—	—	—	Standard	Standard
	24"	24"	30"	24"	30"
	600mm	600mm	750mm	600mm	750mm
	8" x 4"	12" (20" optional) x 8"	12" (20" optional) x 8"	12" (20" optional) x 8"	12" (20" optional) x 8"
00mm	200mm x 100 mm	300mm (500mm) x 200mm	300mm (500mm) x 200mm	300mm (500 mm) x 200mm	300mm (500 mm) x 200mm
	Standard	Standard	Standard	Standard	Standard
	Standard	Standard	Standard	Standard	Standard
	Optional	Optional	Optional	Optional	Optional
	3"	3"	3"	3"	3"
	100mm	75mm	75mm	75mm	75mm
	16" x 9"	25" x 9" (Optional 32"x 8")	25" x 9" (Optional 32"x 8")	25" x 9" (Optional 32" x 8")	25" x 9" (Optional 32" x 8")
25mm	400mm x 225mm	635mm x 230mm (813mm x 203mm)	635mm x 230mm (813mm x 203mm)	635mm x 230mm (813mm x 203mm)	635mm x 230mm (813mm x 203mm)
)	66lbs (30kg)	110lbs (50kg)	110lbs (50kg)	110lbs (50kg)	110lbs (50kg)
kg)	66lbs (30kg)	330lbs (150kg)	330lbs (150kg)	330lbs (150kg)	330lbs (150kg)
	1'	1'	1'	1'	1'
	Standard	Standard	Standard	Standard	Standard
	Standard	Standard	Standard	Standard	Standard
	3 Lens Turret	3 Lens Turret	4 Lens Turret	3 Lens Turret	3 Lens Turret
	Standard	Standard	Standard	Standard	Standard
100,	M1, M2, M3, Mx100, Mx200	M1, M2, M3, Mx100, Mx200	M1, M2, M3, Mx100, Mx200	M1, M2, M3, Mx100, Mx200	M1, M2, M3, Mx100, Mx200
5" All-in- screen PC,	M1 tablet, 15" All-in-One touch screen PC, 24" touch screen monitor with PC, Mx DRO	M1 tablet, 15" All-in-One touch screen PC, 24" touch screen monitor with PC, Mx DRO	M1 tablet, 15" All-in-One touch screen PC, 24" touch screen monitor with PC, Mx DRO	M1 tablet, 15" All-in-One touch screen PC, 24" touch screen monitor with PC, Mx DRO	M1 tablet, 15" All-in-One touch screen PC, 24" touch screen monitor with PC, Mx DRO
	Optional	Optional	Optional	Optional	Optional
	—	Optional	Optional	Optional	Optional
5x, 31.25x,	10x, 20x, 25x, 50x, 100x	10x, 20x, 25x, 31.25x, 50x, 100x	10x, 20x, 25x, 31.25x, 50x, 100x	10x, 20x, 25x, 31.25x, 50x, 100x	10x, 20x, 25x, 31.25x, 50x, 100x
	Optional	Optional	Optional	Optional	Optional
	—	Optional	Optional	Optional	Optional
	—	Optional	Optional	Optional	Optional
	—	Optional	Optional	Optional	Optional
	Optional	Optional	Optional	Optional	Optional
	Optional	—	—	—	—
	Optional	—	—	—	—
	—	Optional	Optional	Optional	Optional
0.5", 0.6",	0.2", 0.5", 0.9", 1.2" 2.3"	0.3", 0.6", 1.2", 1.5", 3"	0.2", 0.5", 0.9", 1.2", 2.3"	0.3", 0.6", 1.2", 1.5", 3"	0.3", 0.6", 1.2", 1.5", 3"
, 13mm, mm, 40mm	6mm, 12mm, 24mm, 30mm, 60mm	7.5mm, 15mm, 30mm, 37.5mm, 75mm	6mm, 12mm, 24mm, 30mm, 60mm	7.5mm, 15mm, 30mm, 37.5mm, 75mm	7.5mm, 15mm, 30mm, 37.5mm, 75mm
", 2.5",	1.7", 3.5", 4", 5", 5.4"	1.9", 2.3", 3.6", 4", 6"	1.7", 3.5", 4", 5", 5.4"	1.9", 2.3", 3.6", 4", 6"	1.9", 2.3", 3.6", 4", 6"
mm, 57mm, mm, 80mm	44mm, 88mm, 103mm, 127mm, 138mm	48mm, 60mm, 92mm, 101mm, 151mm	44mm, 88mm, 103mm, 127mm, 138mm	48mm, 60mm, 92mm, 101mm, 151mm	48mm, 60mm, 92mm, 101mm, 151mm
	—	—	—	—	—
	—	—	—	—	—
	Standard	Standard	Standard	Standard	Standard

\*Systems are not shown in this catalog.



## ACCESSORIES

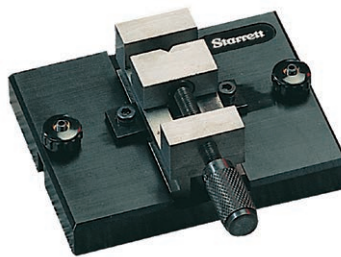
Starrett offers a full range of accessories and purpose-built cabinet stands designed for our optical comparator systems to ensure efficient system setup for a broad range of applications.



L



M



K



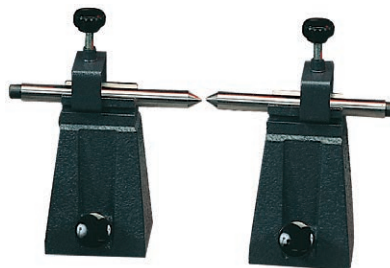
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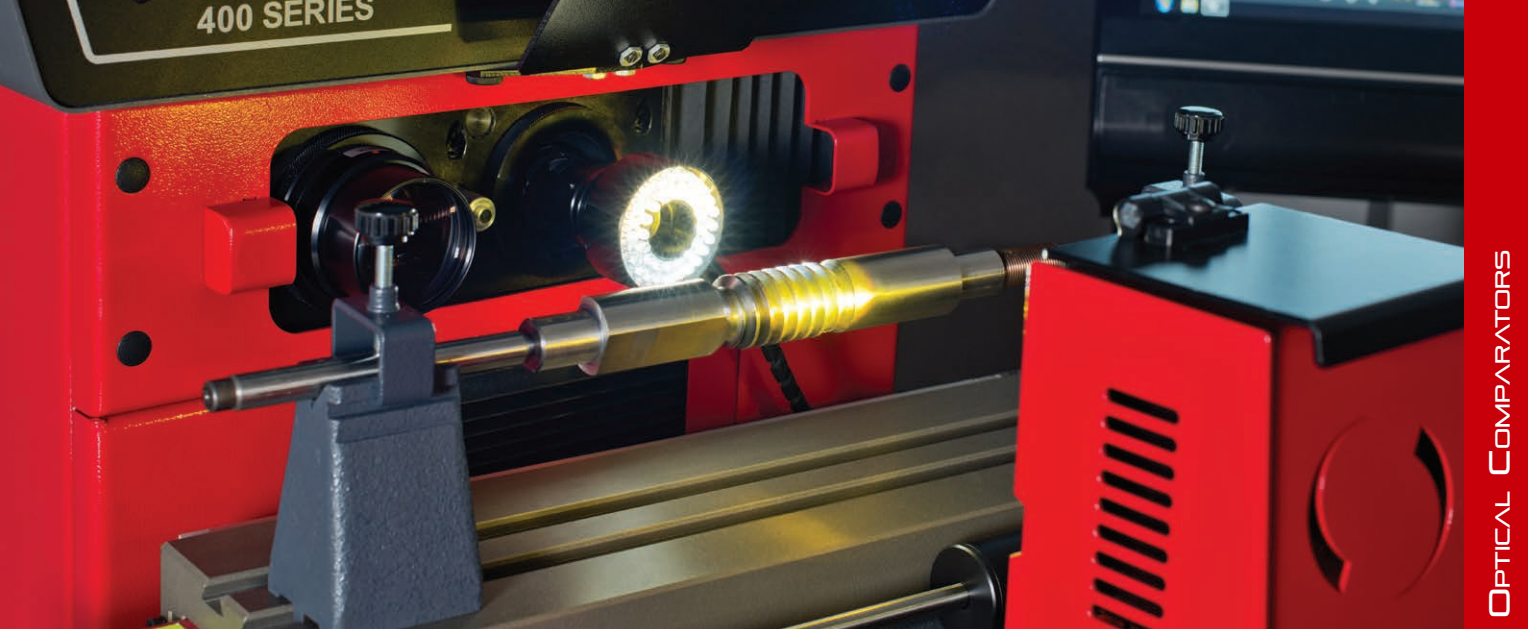
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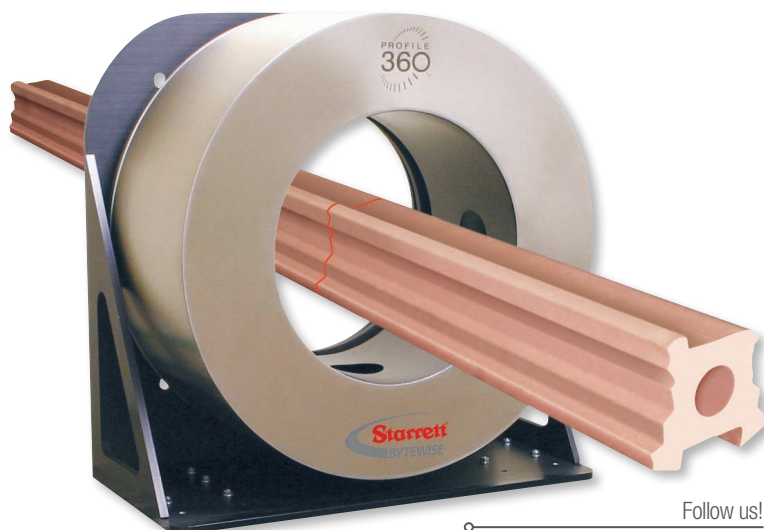
Photo Key	Part No.	Description	For Models
A	OCN8	Large Centers and Vees	HF600, HF750, HDV500
B	ORV2*	2-1/32" Capacity Rotary Vise	HF600, HF750, HDV500
C	4U000*	Magnification Checking Graticule	HE/HB/HD400 and VB400
	OGH1*		HF750
	OGH2*		HF600
D	OCN7	Small Centers and Vees	HF600, HF750, HDV500
E	7P000	Centers and Vees	HE/HB/HD400
F	OVH1	Vertical Glass Plate Holder	HF600, HF750, HDV 500
J	7U000*	Vertical Glass Plate Holder	HB400, HD300, HDV300, HDV400
K	4H003	Rotary Vise with 1-1/4" Capacity	HE/HB/HD400, HF600, HF750
L	6U003	Rotary Work-stage	VB400
M	4H002	Fixed Position Vise with 1-1/4" Capacity	HE400, HB400, HD400, HF600, HF750
N	4H004	Universal Vee Block on Rotary Base	HE400, HB400, HD400, HF600, HF750
O	8170	31" Cabinet Stand	HE400, HB400, HD400, VB300, VB400
	8171	22" Cabinet Stand	HE400, HB400, HD400, VB300, VB400
P	8276	Canopy and Curtains	HE400, HB400, HD400, VB300, VB400

\*Product not shown



## NON-CONTACT IS THE SOLUTION.

Profile360™ is an in-line, real-time, non-contact solution for continuously monitoring key profile dimensions in complex shapes such as rubber, ceramic, plastic, and wood-plastic composite extrusions, roll-formed metal profiles, and profiled wire.



# Starrett®

(978) 249-3551 . starrett.com

Follow us!







M1



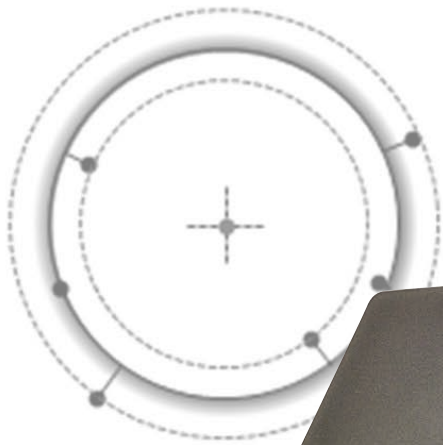
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6 of 6 Form

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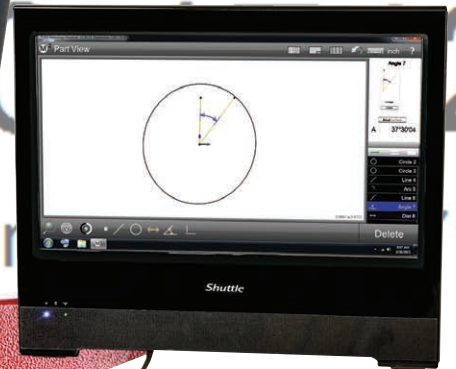
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0.8176

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SOFTWARE

# METLOGIX™ SOFTWARE

## M1& M2

### FOR OPTICAL COMPARATORS

Graphics rich display, large icon buttons, and intuitive operation. Coordinate display for X and Y linear axes and Q angular values for screen rotation. Easy part alignment and datum function.



M1 shown on VB300



M2 All-in-One Touchscreen PC

### FEATURES

- Clean and simple touchscreen interface with large icon buttons and intuitive operation
- Graphics-rich display providing instant information on feature form, tolerances, and measurement data
- Coordinate display for X and Y linear axes and Q angular values for screen rotation
- Easy part alignment and datum functions
- Measure and tolerance these geometric features: point, line, angle, distance, radius, diameter
- As you measure, a part view is created in the feature view. Constructions between features such as distances and bolt hole pattern can be done by simple selections from the part view.
- For repetitive part measurement, create a part program that will visually guide operators through part measurement
- Optional optical edge detection provides better throughput and removes operator subjectivity
- Four different report forms can be printed or exported to Microsoft Excel, text files, or to an SPC program
- M2 utilizes a Windows®-based operating system enables flexible data export and interface capability
- M1 utilizes an Android™ operating system and a Bluetooth® connection to the host Optical Comparator
- Fast, easy connection to printers and networks

	MetLogix™ M1	MetLogix™ M2
Mounted to comparator arm	x	x
Color graphics	x	x
Touch-screen operation	x	x
Operating system	MLX Android™	Windows®
X-Y-Q (angle) measurements	x	x
2D geometry software with skew	x	x
Optical edge detection option	—	x
Interface	Android™ Tablet	15" All-in-one Touchscreen PC

MetLogix™  
www.metlogix.com



### M1& M2

MetLogix™ control software provides a broad range of powerful, user-friendly functions on a compact, icon-based touchscreen interface in place of the traditional control.



# METLOGIX™ SOFTWARE

## Mx100 & Mx200

### FOR OPTICAL COMPARATORS

The Mx100 and Mx200 are shop-hardened digital readouts. A sealed rubber keypad and durable powder-coated enclosure provide lasting performance in any environment from the shop floor to the Quality Control Lab.



Mx200 Shown on HE400



Mx200 shown on HD400



Mx100



Mx200

MetLogix™  
www.metlogix.com



### Mx100 & Mx200

MetLogix™ control readouts provide a broad range of powerful, user-friendly functions on a compact, icon-based touchscreen interface in place of the traditional control.

### FEATURES

- Clean, simple and durable interface with large rubber buttons and intuitive operation
- Graphics-rich display providing instant information on feature form, tolerances, and measurement data on 7" color screen
- Coordinate display for X and Y linear axes and Q angular values for screen rotation
- Easy part alignment and datum functions
- Measure and tolerance these geometric features: point, line, angle, distance, radius, diameter
- As you measure, a part view is created in the feature view. Constructions between features such as distances and bolt hole pattern can be done by simple selections from the part view.
- For repetitive part measurement, create a part program that will visually guide operators through part measurement
- Optical edge detection on Mx200 provides better throughput and removes operator subjectivity
- Four different report forms can be printed or exported to Microsoft Excel, text files, or to an SPC program
- Mx-Series utilizes a customized Android™ operating system
- Fast, easy connection to printers and networks
- MxLink technology on the Mx200 model allows users to transfer measurement data instantly and wirelessly to a network Windows® computer

	MetLogix™ Mx100	MetLogix™ Mx200
Mounted to comparator arm	x	x
Color graphics	x	x
Touch-screen operation	x	x
Operating system	MLX Android™	MLX Android™
X-Y-Q (angle) measurements	x	x
2D geometry software with skew	—	x
Optical edge detection option	—	x
Interface	MetLogix™ DRO	MetLogix™ DRO

# METLOGIX™ SOFTWARE

## M3

### FOR VISION SYSTEMS

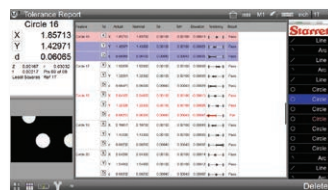
Multi-touch software control that can pan and zoom with pinch, swipe, or touch. Works with active part views and live video feeds (or use the conventional mouse interface). Custom "Eye Measure" probe captures complex edges generated by a finger path drawn on the touch screen. Measure Logic probe intelligence provides instant feature determination and measurement with a single touch.

### FEATURES

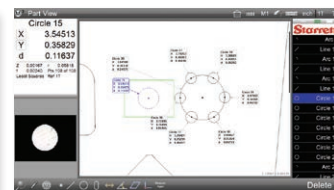
- DXF CAD file import for comparing parts being inspected to the actual design file; no need for cumbersome Mylar overlays
- "Vtouch" Probe has video touch probe functionality – just click for simple acquisition of points on a feature's edge
- Part View can generate distance and tangent lines from within the graphical part view. The "Gesture Menu" can be used for feature creation and manipulation tools.
- "Quick Annotate" allows data on several features to be displayed simultaneously with smart marquee feature selection
- Application of universal tolerance value entry according to feature resolution groupings
- Feature Detail Graphics: Individual feature views display point cloud distributions, nominal deviations, and tolerance results. Scroll through Actual, Nominal, Tolerance, Deviation and Data Fit Type information
- Simple machine/camera calibration with popular machine and video correction methods
- Windows®-based, globally recognized OS for flexible data exporting and interface with Windows® applications
- DC (FOV) software option



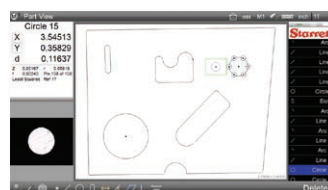
Intuitive graphic menu



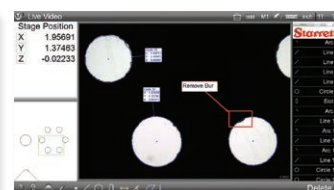
Display flexibility or export the measurement report



Graphic window with selectable Features and notes

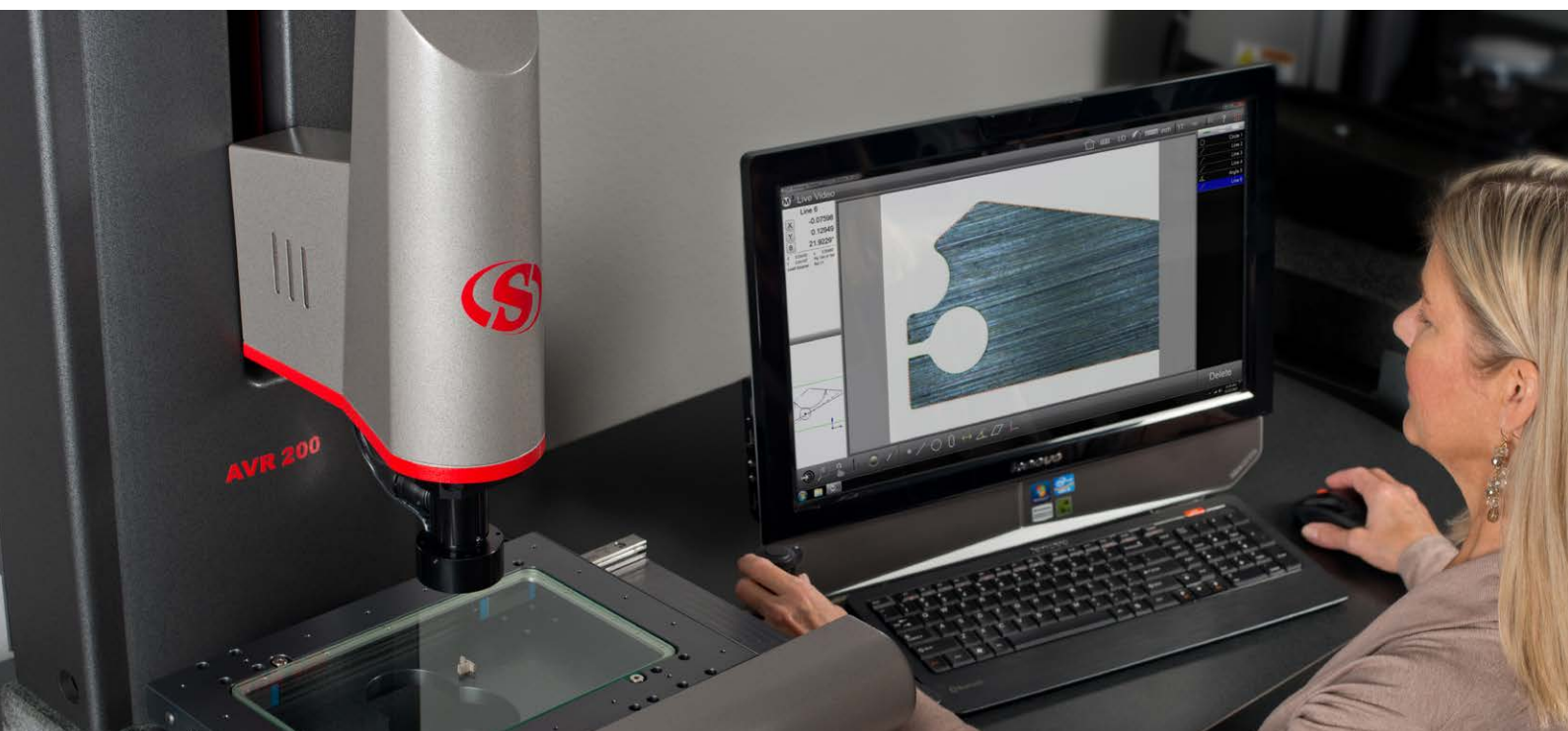


Graphical window with the selected data points



Live video image with data from selected points

MetLogix™  
www.metlogix.com





# METLOGIX™ SOFTWARE

## M3

### FOR OPTICAL SYSTEMS

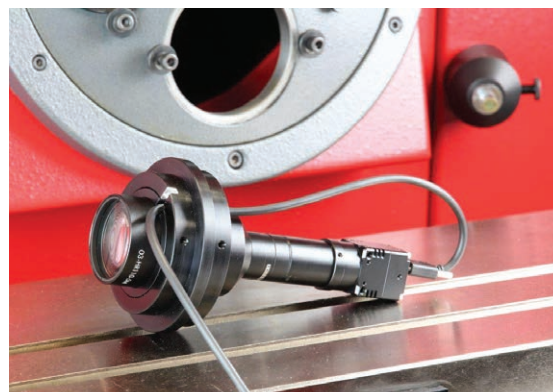
Full CNC control software that is used in conjunction with the OV2 zoom video camera and/or the TOV2 telecentric video camera systems. The M3 system allows for both conventional mouse point-and-click control as well as touchscreen pan and pinch zoom for feature measurement.

#### FEATURES

- DXF CAD file import for comparing parts being inspected to the actual design file; no need for cumbersome Mylar overlays
- "Vtouch" Probe has video touch probe functionality – just click for simple acquisition of points on a feature's edge
- Part View can generate distance and tangent lines from within the graphical part view. The "Gesture Menu" can be used for feature creation and manipulation tools.
- "Quick Annotate" allows data on several features to be displayed simultaneously with smart marquee feature selection
- Application of universal tolerance value entry according to feature resolution groupings
- Feature Detail Graphics: Individual feature views display point cloud distributions, nominal deviations, and tolerance results. Scroll through Actual, Nominal, Tolerance, Deviation and Data Fit Type information
- Simple machine/camera calibration with popular machine and video correction methods
- Windows®-based, globally recognized OS for flexible data exporting and interface with Windows® applications
- DC (FOV) "digital comparator" software option



OV2 Video camera for Optical Comparators work with M3 software



TOV2 Video camera for Optical Comparators work with M3 software





# CONTACT INFORMATION GUIDE FOR NORTH AMERICA

COMPLETE, UP-TO-DATE CONTACT INFORMATION AVAILABLE AT STARRETT.COM

## PRIMARY CONTACTS, SALES AND GENERAL INFORMATION

- **World Headquarters and Precision Tools:**  
Athol, MA (978) 249-3551
- **Metrology Equipment:**  
Starrett Kinematic Engineering, Inc.  
Laguna Hills, CA (949) 348-1213
- **Laser Measurement:**  
Columbus, GA (706) 323-5142
- **Granite Surface Plates and Accessories:**  
Waite Park, MN (320) 251-7171
- **Gage Blocks:**  
Cleveland, OH (440) 835-0001
- **Mexico:**  
Saltillo, Coah, Mexico (844) 432-4660

## CALIBRATION

- **Precision Tools and Gages:**  
Athol, MA (978) 249-3551
- **Starrett Calibration Services:**  
Duncan, SC (864) 433-8407
- **Metrology Equipment:**  
Starrett Kinematic Engineering, Inc.  
Laguna Hills, CA (949) 348-1213
- **Granite Surface Plates and Accessories:**  
Waite Park, MN (320) 251-7171
- **Gage Blocks:**  
Cleveland, OH (440) 835-0001
- **In Mexico, please call (844) 432-4660**

## REPAIR

- **Precision Tools and Gages:**  
Athol, MA (978) 249-3551
- **Metrology Equipment:**  
Starrett Kinematic Engineering, Inc.  
Laguna Hills, CA (949) 348-1213
- **Granite Surface Plates and Accessories:**  
Waite Park, MN (320) 251-7171
- **Gage Blocks:**  
Cleveland, OH (440) 835-0001
- **In Mexico, please call (844) 432-46-60**

## CUSTOM SOLUTION DEVELOPMENT

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- **Metrology Systems Development and Configuration:**  
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## ADDITIONAL AND/OR UP-TO-DATE INFORMATION

- [starrett.com](http://starrett.com)
- **Product Literature and Educational Materials:**  
Select the "Catalogs" button at [starrett.com](http://starrett.com) to order printed product information and to access literature PDFs for viewing and/or downloading
- **In Mexico, please call (844) 432-4660**





## CORPORATE HEADQUARTERS AND MAIN FACTORY

### THE L.S. STARRETT COMPANY

121 Crescent Street  
Athol, MA 01331-1915 - U.S.A.

Tel: (978) 249-3551  
Main Fax: (978) 249-8495

## INTERNATIONAL LOCATIONS

### BRAZIL

Starrett Indústria e Comércio Ltda.  
Av. Laroy S. Starrett 1880 - Bairro Pinheirinho  
Caixa Postal 171  
13306-900 Itu, São Paulo - Brazil

Tel: 55 11 2118-8200  
Fax: 55 11 2118-8003

### SCOTLAND

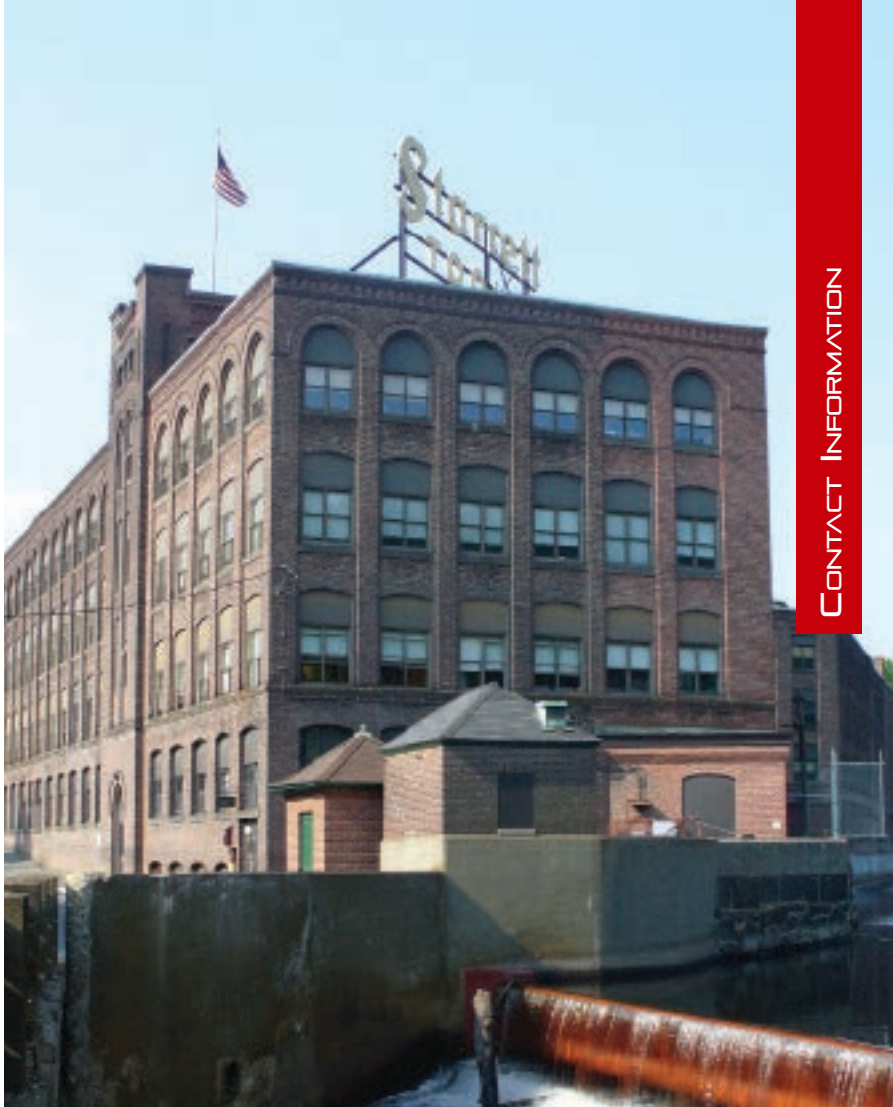
The L.S. Starrett Company Ltd.  
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Fax: 44 (0) 1835 863018

### CHINA

Starrett Tools (Suzhou) Company Limited  
Suzhou Industrial Park  
No. 339. Su Hong Zhong Road  
Suzhou, Jiangsu Province  
P.R. China 215021

Tel: 86 512 6741940



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## METROLOGY SYSTEMS



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